THE

UNITED SERVICE.

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JUNE 1893.

THE CONSTITUTION AND ORGANIZATION OF THE FLEET.

OUR navy is now composed of forty-two vessels of war. This number includes the vessels completed, in process of construction, and those authorized by act of Congress. They may be divided into two classes, battle-ships and cruisers; the former comprising such vessels as would be placed in the line of battle for heavy fighting, the latter constituting the sea-police of the national force. Again, the cruisers may be subdivided according to general size into four classes, for convenience of assignment to squadron duty and other service conditions.

With the above subdivision of the fleet, the following table shows the effective force of the navy for all purposes, not including torpedo-boats, tugs, or the Ammen ram:

TABLE I.

Battle-Ships.

Massachusetts,	Indiana,	Maine,
Texas,	Puritan,	Miantonomoh,
Terror,	Amphitrite,	Oregon,
Iowa,	Monadnock,	Monterey.

Cruisers.

First Rate.	Second Rate.	Third Rate.	Fourth Rate.
New York,	Philadelphia,	Cincinnati,	Castine,
Brooklyn,	Baltimore,	Raleigh,	Machias,
No. 3,	San Francisco,	Marblehead,	Dolphin,

Cruisers—Continued.

First Rate.	Second Rate.	Third Rate.	Fourth Rate.
Columbia,	Charleston,	Montgomery,	Bancroft,
Olympia,	Atlanta,	Detroit,	Petrel,
Chicago.	Boston.	Mohican,	Yantic.
		Yorktown,	
		Marion,	
		Bennington,	
		Alliance,	
		Concord,	
		Kearsarge.	

THE BATTLE-SHIPS.

Of the battle-ships included in the table, nine are on the eastern seaboard, three on the western, it being assumed that the last battle-ship authorized by Congress will be constructed on our eastern coast. This location of the battle-force is the natural subdivision, being in accordance with the length of sea-coast to be defended. Taking this moderate force as the probable number of battle-ships the navy is to have, it may be conveniently arranged into two general squadrons of defense: that on the Atlantic coast to be called the "Eastern Squadron of Defense," that on the Pacific, the "Western Squadron of Defense," and these squadrons to be so called officially.

The Eastern Squadron of Defense may be subdivided into three divisions, to be named the Northern, Central, and Gulf Divisions in time of war or mobilization; the general designation of "Eastern Squadron of Defense" being used in time of peace as applying to those vessels kept in commission.

The comparatively small sea-coast on the Pacific open to attack would render any subdivision of its defensive force unnecessary.

Of the defensive squadrons, a portion of each should be kept in commission at all times, the remainder to remain in ordinary, but in a condition that would enable them to be supplied fully and manned on a week's notice; the stores of every description needed for any one ship (except perishable) to be stored by itself, marked for that particular vessel, periodically inspected, and maintained in perfect readiness for immediate issue upon receipt of orders for service use. The new allowance-book now in preparation renders this possible. This preliminary preparation of the outfit for the ships in ordinary should be of the most thorough character, one general method, carefully worked out, to be followed in all cases. In fact, one general plan of yearly mobilization of the battle-force can easily be elaborated, simple and perfect in detail as to equipment and *personnel*, resulting in prompt concentration and effective use of the great bulwark of national defense; but, as this mobilization must necessarily be based upon confidential plans, it is not, probably, wise to enter into its public discussion. But it is suggested that in the formulation of any such scheme the best ability in the ser-

vice should be made use of, not the theoretical but the practical minds being brought to bear on a subject upon the success of which may depend the successful maintenance of our national dignity, and thus avoid our country's temporary humiliation.

Taking it for granted that a mobilization scheme will be formulated, the following estimate of *personnel* is given as to the force needed to be held in service or reserve, ready in all respects as to detail and appointment to the several ships, so that upon receipt of orders, or notice, the squadron can be placed in actual fighting condition and rendezvoused at designated places in the shortest possible time.

TABLE II.

Eastern Squadron of Defense.

BATTLE-SHIPS.	Admirals.	Commodores.	Commanding Officers.	Lieutenant-Commanders.	Lieutenants.	Ensigns.	Blue-Jackets.	Marines.
Massachusetts	. . .	. . .	1	1	5	4	300	30
Indiana	1	. . .	1	2	7	4	300	30
Puritan	. . .	. . .	1	1	5	4	150	20
Texas	. . .	. . .	1	2	6	4	250	30
Maine	. . .	1	1	1	5	4	250	20
Miantonomoh	. . .	. . .	1	1	5	. . .	125	20
Terror	. . .	. . .	1	1	5	. . .	125	20
Amphitrite	. . .	1	1	2	5	. . .	125	20
Iowa	. . .	. . .	1	1	6	4	300	30
Total	1	2	9	12	49	24	1925	220

To render any scheme of naval mobilization effective and to discover any weak points, periodical assembly of the defensive fleet is essential, and it is suggested that this assembly should take place yearly, for a period of time, say three months, and at such a time in the year as the Navy Department may select. It is only by practice and thorough work that it can be achieved.

One of the three squadrons (three vessels) should be in commission at all times and constitute a nucleus for the general assembly, its *personnel* being available as a working force (officers and men) to provision, etc., those vessels in ordinary while the details for these ships are reporting. This battle-force, again, would constitute the practical school for officers and men from the cruising fleet. That such a school would prove valuable cannot be questioned, and through this course of practical war service every officer below flag rank and every man should be required to serve.

By extending the length of service of enlisted men to four years, and as the maximum age of apprentices now shipped allows four years

of active service, the Department would have ample margin to man this battle-squadron and finish the three years' foreign service on cruising ships. At no one time would the single squadron, in time of peace, require more men than would be required to man one of the flying squadrons, as will be explained farther on, or about nine hundred men.

Of course when mobilization takes place a larger number would be needed, and this temporary increase would have to be provided for by Congress,—say for four or six months, special compensation for this reserve being fixed by law.

TABLE III.

Western Squadron of Defense.

Battle-Ships.	Admirals.	Commodores.	Commanding Officers.	Lieutenant-Commanders.	Lieutenants.	Ensigns.	Blue-Jackets.	Marines.
Oregon	...	...	1	2	7	4	300	30
Monterey	1	...	1	1	5	...	200	20
Monadnock	...	...	1	1	5	...	125	20
Total	1	...	3	4	17	4	625	70

The Western Squadron of Defense being composed of three battleships, two should be kept in commission at all times, one in reserve, or ordinary. The climate of the Pacific coast permits of drills at all seasons, and its coast waters are well adapted for the preservation of metallic hulls. Should, by reason of scarcity of men, it be found inexpedient to keep two of these ships in commission, one should at all times be ready to put to sea at a moment's notice, and mobilization of the three be had once a year, as on the Eastern seaboard.

With these squadrons judiciously officered, well manned, and moved in its operations to accomplish the best practical training for the *personnel*, it is believed this particular service can be made attractive and inspiriting, so essential to definite good results in their bearing upon the final end aimed at, which is the highest efficiency in time of war. From any point of view, the work should be carried on on a practical war basis, and nothing of a diverting nature should be allowed to interfere with this laudable end, so desirable to attain. Experience in our profession, as in all others, is the great teacher, and it is only by cruising together in the manner proposed that the results of this experience can best be made use of, and in developing that *esprit de corps* in the entire *personnel* engaged, which means increased efficiency and resultant national security. We have a splendid corps of highly-intel-

ligent officers, a steadily-improving class of sailormen (no country possesses a better); therefore, with the fine ships our country gives us for its defense, should our aim be high, and it should be most gratifying to the service at large that the opportunity has arrived to demonstrate to the people that we are worthy of the great trust reposed in us as the major arm of national defense from foreign assault. By earnest endeavor, working together for the best interest of the service, putting aside the temptations for personal preferment, each doing his fair share of the disagreeable work incident to our profession, and thus possessing the feeling that he has done his fair share of legitimate work, the result is assured.

Our defensive force, divided, then, as proposed, will appear as in the following table, the squadrons being arbitrarily chosen for illustration:

TABLE IV.

Eastern Squadron of Defense (commanded by an admiral).

Massachusetts, Maine, Miantonomoh,	Northern Squadron (commanded by a commodore).
Indiana, Puritan, Terror,	Central Squadron (Flag Squadron).
Iowa, Amphitrite, Texas,	Gulf Squadron (commanded by a commodore).

Western Squadron of Defense.

Oregon, Monterey, Monadnock,	Commanded by an admiral.

It may be said as to our present battle-fleet that, while in numbers it is large enough, in some of its units there is much room for improvement. The monitor class, while useful for harbor defense, for any actual battle-purposes at sea are useless. Their low speed, lack of turning power, and very small freeboard at once take them out of the effective battle-class. The four battle-ships "Massachusetts," "Indiana," "Oregon," and "Iowa" are as fine types of that class of armored vessels as can be shown by any nation. The "Maine" and "Texas" may prove themselves more effective than many officers think, but it is to be hoped Congress may shortly see its way to replace the monitor class with more powerful modern battle-ships of the first class. For purely defensive purposes the present number of ships is sufficient, it only remaining to bring its component parts to the highest point of effectiveness. With our battle-fleet thus strengthened, the nation could experience a feeling of security not possible as things now are. But it

becomes our duty as naval officers to study carefully the best means to get the most out of the ships we have, and thus do our part to render the national defense against foes from without as perfect as lies within our power, trusting to wise legislation for future aid.

THE CRUISING FLEET.

Referring to Table I., it will be seen that there are thirty vessels that can be classed as cruisers, divided into four rates,—first, second, third, and fourth. The question is presented as to the best disposition of this portion of the naval forces, to the end that American interests can be most efficiently protected at home and abroad in time of peace, and secure an auxiliary force in time of war. It constitutes the national police force on the high seas, and its duties are necessarily of a general character. All nations recognize its great importance, and those financially able maintain a cruising force commensurate with their maritime importance among nations.

We have now five naval stations, as follows: the North Atlantic, Brazil, Pacific, China, and the European. In the past it has been deemed necessary to keep a naval force of varying size on the different cruising-grounds. Assuming that five cruising squadrons are necessary, I divide the cruising ships into six groups, as shown in the table below, each squadron to be composed of five ships, one first-rate, one second-rate, two third-rate, one fourth-rate,—the first-rate vessel being, of course, the flag-ship of its squadron.

TABLE V.

	First Rate.	Second Rate.	Third Rate.	Fourth Rate.
No. 1 . .	New York.	Philadelphia.	Cincinnati. Montgomery.	Castine.
No. 2 . .	Brooklyn.	Baltimore.	Mohican. Yorktown.	Machias.
No. 3 . .	Cruiser No. 3.	San Francisco.	Marion. Raleigh.	Dolphin.
No. 4 . .	Columbia.	Charleston.	Marblehead. Concord.	Petrel.
No. 5 . .	Olympia.	Atlanta.	Detroit. Alliance.	Yantic.
No. 6 . .	Chicago.	Boston.	Kearsarge. Bennington.	Bancroft.

It has been suggested that the squadrons proposed would be better balanced by adding to each one more vessel of the "Machias" class, or fourth rate. This is true; but we must always be guided by what we have, and not what we may possibly get. Should additional vessels of the smaller class be authorized and built, no better disposition could be made of them. Satisfactory work with what now exists is the best way to obtain increase of force as circumstances will warrant. It is also

true that a certain amount of ship-construction must be ordered periodically to make up for the wear and tear incident to the service; but that is the affair of the Navy Department. It is believed the arrangement of the vessels in the squadrons as given is the best with the present force available.

The sixth group or squadron would remain unemployed, and be in the hands of dock-yard people for a general overhauling and preparation for active cruising duty.

It may be said that the crews allowed the different vessels in the table (VI.) are too small. But I think those officers who have served aboard the new ships will agree in saying that, with the improved rapid-firing calibres and introduction of mechanical means for handling the ship, a reduction to the figures given can be done without impairing the ship's efficiency and with manifest increase of comfort to the crews. In time of war, if deemed necessary, the complement could be increased, but to my mind the allowance given is ample for all purposes. In fixing the number above allowed in the crews, it is assumed that every man in the ship's company has something to do with fighting the ship. The idlers must be minimized, the actual working force kept at the maximum. Much can be done in this direction by combination of present duties in some ratings. We have too many idlers in our ships. Every man's value should be weighed in the balance of actual combat, which is the object of a ship of war.

The following table shows the number of line officers, blue-jackets, and marines necessary to man any one of these groups, and that number would answer for any of them:

TABLE VI.

Vessels.	Admirals.	Commanding Officers.	Lieutenant-Commanders.	Lieutenants.	Blue-Jackets.	Marines.
New York	1	1	2*	7*	350	35
Philadelphia	. . .	1	1	6	300	25
Cincinnati	. . .	1	1	6	200	20
Montgomery	. . .	1	1	6	150	20
Castine	. . .	1	. . .	7	100	
Total	1	5	5	32	1100	100

* The additional ones are for staff duties. The junior officers are omitted.

With the five groups or squadrons in active service there would be afloat in the aggregate 5500 men, 500 marines, and 215 line officers. Any one squadron, when concentrated, could land an effective force of

500 blue-jackets and 100 marines, or 600 in all, exclusive of hospital corps, pioneers, or band. It is hardly to be expected that any larger force would be needed, in time of peace, at any point on foreign stations.

This modification of our ships' companies calls for most careful consideration on the part of officers seeking the highest efficiency of our service. Innovations must be received with much caution, but certain it is that in recent years the idlers aboard ship are seemingly on the increase, with a corresponding decrease in the number of men who have to bear the brunt of the drudgery on sea-going vessels. It is recognized that the new order of things incident to new kinds of ships calls for a wider field and greater dispersion of the aggregate force on shipboard; but as it is a matter of deck-work generally, and especially heavy work, such as coaling and cleaning ships in dry-dock, the idlers should be few and far between. The old call of the boatswain of "All hands" may be a thing of the past, but the simple pipe "Coal ship," or "Clean ship," should mean that every man has his station and must be there in the midst of the work, with both hands. To many this may seem a trivial diversion, but to my mind it means much to an efficient, ready ship.

Again, it must be borne in mind that the number of men allowed, or likely to be allowed, for manning our ships will be comparatively small in time of peace, as compared with first-class maritime powers, and therefore it becomes the duty of our officers to accomplish the best results with the present number of men, and in this way assist the Navy Department to show that our present effective work is most worthy of the liberality of Congress towards our branch of the service.

With our cruising force divided as above, the question that presents itself is, How can it be most effectively utilized, first, in time of peace; secondly, as an auxiliary force to the battle-fleet in time of war?

Considering the first part of the question, How can our cruising ships be best utilized in time of peace? I submit the following, not by any means as a final answer, but as the first step, riper experience and keener minds evolving therefrom, it is hoped, the result which, as naval officers, we all should hope for,—maximum efficiency and definite results. In general terms, the proposition submitted is to make five of the squadrons "flying squadrons," styling them officially Squadrons Nos. 1, 2, 3, 4, 5. No. 6 to be called the Relief Squadron. Now, this cannot, at present, be done all at once, on account of many of the ships being on the different stations at this time; but the general rendezvous of as many ships as possible on the eastern coast in the spring of 1893 would present a most favorable opportunity for inaugurating the plan outlined below.

During the summer of 1893 prepare for sea, in all respects, Squad-

ron No. 1 (see Table VI.). Rendezvous it at Hampton Roads during the first half of September; let it sail in squadron for its first cruising-ground, the West Indies, on October 1. When the first squadron is off on its cruise, prepare Squadron No. 2, fixing the date of rendezvous at a period six months later than No. 1, at the same place. On April 1, 1894, Squadron No. 2 to sail in squadron, bound for some prearranged important West India port, say St. Thomas. Here Squadron No. 1 should be waiting to be relieved, and, as soon as the flag-officers could turn over all necessary information and papers, No. 1 proceeds in squadron to its next cruising-ground, the present Brazil Station. Squadron No. 3 is now in preparation, and assembles in Hampton Roads in September, ready to sail as the relief of No. 2, the latter moving on to the relief of No. 1, which proceeds by the Straits of Magellan to the Pacific.

When No. 1 is relieved on the Pacific Station, it keeps on for the present China Station for six months, and when relieved here proceeds to the present European Station for the same period; thence, when relieved, home, to be paid off, ending its three years' active cruise at Hampton Roads, ready for distribution to places for refitting and service six months later. Thus, in turn, the five flying squadrons might be considered as circling the world as a cruising-field, while No. 6 is being got ready to take its turn. The period of six months is fixed as the general length of stay on each cruising-field, and this is to include the time occupied in moving forward to the relief of the squadron in advance. It is hardly necessary to say that the flag-officer should carefully plan the work ahead for his squadron while on the way to a particular station, modifying it as the information of his predecessor may suggest, at the same time keeping in view that telegraphic touch must be kept by some of his squadron with the Navy Department to receive special orders. As the time for docking the new ships is generally fixed at six months, and as this time is all allowed to any one cruising-ground, special attention must be given to this important need of steel vessels in their progress around the world, and the movements of the several ships so arranged as to bring them within reach of docking facilities during the squadron's stay on any one station. Experience shows that a steel ship's bottom, when very foul, can be carefully cleaned by divers (her own) in a few days; and while more or less paint is removed, and possibly the metal slightly exposed in places, no injury need be feared, provided a dry-dock can be reached in less than six weeks or two months.

As a matter of convenience, and to further the plans of the commanders-in-chief of the squadrons, arrangements should be made at stated times for a prompt supply of coal at designated ports, and shipments from home of such special provisions and stores as cannot be readily and economically procured on the several cruising-grounds.

Any comprehensive cruising scheme should embrace this important subject, the Department, from the Intelligence Office, obtaining the necessary information that would enable it to decide the ports best adapted for the purpose. And in this connection it may be said that too much importance cannot be given to the immediate preparation for sea on arrival in port. A cruising vessel should at the earliest possible moment after reaching port be in readiness to put to sea at an hour's notice, when coaled and provisioned; and, except in extraordinary circumstances, her bunkers should be filled when coal can be had to reasonable advantage. The importance of an ample supply of coal to the modern fleet cannot be overestimated, calling for the fullest information on the part of the flag-officers, and this information should be kept up to date. Successful naval operations in the future depend upon it.

While the utmost care should be taken in the preparation of a squadron for foreign service, some fittings or defects may be discovered soon after sailing. This is generally the case in single ships, and doubtless the remedy for these troubles can be easily given by the commanding officers. But it is claimed that with the plan now adopted by the Department of ordering the commanding and executive officers to the ship before commissioning, a vessel reported ready should start prepared to be as nearly self-sustaining as human foresight can achieve. With the firm resolve to make what is given them answer all purposes, the commanding officer and his executive can attain and retain efficiency in service without periodically blocking up the dock-front of some convenient navy-yard. Every one knows, and it is certain that the Navy Department is aware, that there is a great difference between ships of the same type, fitted alike in all respects, as to readiness when needed. One will be found prompt and effective, the other frequently in the hands of the navy-yard workmen, undergoing some minor alterations that may affect the comfort of the people on board, but not her efficiency as a fighting craft. With an earnest desire to accomplish satisfactory work, once under way from the home station, let the ships, except in the most urgent cases, be made self-reliant. Important and absolutely needed dock-yard repairs should be communicated well ahead to the Department, so as to complete them with all possible promptness when ordered. Much complaint has appeared in the public press in recent years about ships of war lying idle or under repairs at the navy-yards. No one can doubt that to some extent naval officers themselves are to blame for this. Let every officer, with the desire to keep the good opinion of our people at large, do his proper share to avoid this adverse criticism. No better way to do this can be found than by making answer what is given us with which to work. If one way will not work, another may be found. Let us seek it. Economical management of our ships means much to the future navy. It

means more and better ships, more efficiency, and is certain to command the approbation of our great thinking nation.

The detail of officers for the squadrons fitting for foreign service should be made as far ahead as possible, and the officers notified to hold themselves in readiness for foreign service, in order that ample time may be had by those so notified to make all domestic or other arrangements necessary for a three years' absence from home.

In cruising around the world, the movements of the ships on the several cruising-grounds should be so planned as to bring each one into one or more ports to give the crews liberty. Nature requires this, and it adds much to the contentment of the men. It is no small education to be able to see the novelties in foreign countries, and the chance to do so would be an inducement for many to enlist and continue in the service, and we might look for a superior class of intelligent men as one of the results.

In voyaging from station to station the ships should be kept in squadron, and exercised in all fleet formations, evolutions, and drills. Experience shows this results in emulation of the best character. Nothing so inspirits a ship's crew as to be in direct competition with others in their company. Again, it should be so arranged that the squadrons should enter important ports as a squadron, and not be arriving separately. The moral effect of a number of ships entering a port together cannot be questioned. On nearly every station there are two or more of such harbors.

After visiting a port in squadron, the necessary dispersion can be made to cover adjacent places to be visited, and a rendezvous off a stated important port arranged so that the squadron may enter it in company. This proposed movement of the squadrons may not be possible in all cases, but it should be made the general rule. The question of "sea service for officers" also enters as an advantage of the moving squadrons. Those detailed for any one of them start with the knowledge of a full cruise ahead. The monotony of a single station becomes a thing of the past. All are exposed to varying climatic effects, and the old-time "West Indies cruiser" becomes a misnomer. The trouble of the past and growls as to particular service on a particular station are eliminated; all hands take their fair share of the disagreeable, as well as from the other point of view, in all quarters of the globe. Changes in the *personnel* of the squadron from start to finish should be based only upon the most urgent reasons, and, when practicable, any officer detached during his cruise should rejoin his ship when the cause of detachment is removed. Let all feel that official identity with the squadron commences with its sailing and ends only with the wind-up of its cruise. It is to be hoped we would in this manner accomplish practically a recognized need in the navy,—a sea-going roster for all grades of officers.

The objection may be raised that the expense may be too great to carry out the flying squadrons proposed. But I hold that, under judicious management at the most economical speeds, all necessary work on the stations can be done at no greater outlay than called for at present. How often has it occurred that a ship lying at a yard is suddenly needed and is sent off at top speed to some scene of need! This means large coal-consumption, increased strain on boilers and machinery, possibly requiring further repairs on her return. Such sudden calls would be to a large extent done away with when a constant force is on its cruising-ground. Another subject for consideration is the matter of desertions. The chief of the Bureau of Navigation, in his last annual report, gives the desertions in our service as being ninety per cent. in home ports, ten per cent. in foreign. Under the cruising project proposed, this strain on our enlisted force would certainly be greatly modified, if not obliterated. This would also mean a considerable saving in money to the Bureau of Navigation. Courts-martial for this offense would be comparatively few, and general muster on the first Sunday in the month would not be looked forward to with so much dread by those in the ship not accustomed to being much on their feet.

MANNING THE FLEET.

The number of men allowed by law is seven thousand five hundred. Referring to the table of vessels in the cruising squadrons, including the one fitting for sea and the battle-squadrons always in commission, we find the aggregate number of men needed to be seven thousand, leaving a margin of only five hundred for outside purposes, such as crews for receiving-ships. If the present allowance is to remain, all enlisted men employed outside of strictly naval work must be called back to their service work. Blue-jackets now used in the Coast Survey, Fish Commission, and minor navy-yard duties amount to several hundred. Either the authorized number should be increased by this number or the navy should not be required to stand the drain upon its resources. For some years the cry of "not enough men" has been heard. Why not diminish this complaint by those employed in duties which, while incidentally connected with the service, are under the jurisdiction of other branches of the public service? Either take them into actual full control of the Navy Department, which bears the major part of its cost, or let the Treasury Department supply its own *personnel*. Eliminating all outside calls for our enlisted men, the present number allowed would furnish a good complement to all its ships likely to bear the brunt of battle. Assuming the force to be made up of the battle-ships, with the first and second rates as vedettes, the following table shows the number of line officers and men required to man it:

TABLE VII.

VESSELS.	Admirals.	Commodores.	Commanding Officers.	Lieutenant-Commanders.	Lieutenants.	Ensigns.	Blue-Jackets.	Marines.
Massachusetts	. . .	1	1	1	7	4	300	30
Indiana	1	. . .	1	2	7	4	300	30
Puritan	. . .	. . .	1	1	5	4	150	20
Texas	. . .	. . .	1	2	5	4	250	30
Maine	. . .	. . .	1	1	5	4	250	30
Miantonomoh	. . .	. . .	1	1	5	. . .	125	20
Terror	. . .	. . .	1	1	5	. . .	125	20
Amphitrite	. . .	. . .	1	2	5	. . .	125	20
Iowa	. . .	1	1	1	7	4	300	30
Oregon	1	. . .	1	2	7	4	300	30
Monterey	. . .	. . .	1	1	5	. . .	200	20
Monadnock	. . .	. . .	1	1	5	. . .	125	20
New York	. . .	. . .	1	1	6	4	350	35
Columbia	. . .	. . .	1	1	6	4	350	35
No. 3	. . .	. . .	1	1	6	4	350	35
Chicago	. . .	. . .	1	1	6	4	350	35
Brooklyn	. . .	. . .	1	1	6	4	350	35
Olympia	. . .	. . .	1	1	6	4	350	35
Philadelphia	. . .	. . .	1	1	6	. . .	300	25
Baltimore	. . .	. . .	1	1	6	. . .	300	25
San Francisco	. . .	. . .	1	1	6	. . .	300	25
Charleston	. . .	. . .	1	1	6	. . .	300	25
Boston	. . .	. . .	1	1	6	. . .	250	25
Atlanta	. . .	. . .	1	1	6	. . .	250	25
Total	2	2	24	28	140	52	6350	660

The number of men required to man all the battle-ships now authorized is, according to the table, eighteen hundred and fifty. Assuming one of the Eastern battle divisions is in commission and one of the Western, the number of men required would be about one thousand. The question is how to get this number in the shortest time. The men must possess service training in order to avoid the danger that would follow manning such complicated structures with green hands. Referring again to the table of cruising squadrons, we find the number of men on board the third- and fourth-rate vessels to be two thousand. These two classes of vessels in time of war, owing to their moderate speed and light armament, would have very subordinate work in connection with the battle-fleet, and temporarily, at least, their services would be dispensed with until additional men could be shipped. Allowing thirty per cent. of their crews for taking care of the vessels until remanned, we could have a force of trained men to throw on board the battle-ships in ordinary. Such a ship's company would in a few days have the vessel in good fighting trim. There need not be much time lost in thus temporarily unmanning the smaller cruisers, as during the time they are hurrying home from distant stations recruit-

ing could be actively pushed, and these recruits could be at once divided among them as they arrived at a home coast.

Under telegraphic orders to proceed home with dispatch, it is believed the men from these vessels would be available in three weeks; those from the European, Brazil, and Home Stations reaching the Eastern Battle-Fleet, those on the Pacific and China Stations combining for the Western Squadron of Defense.

It might be considered wise, in time of war, to increase the complements here allowed by sixteen per cent. This increase would allow for the manning of the battle-fleet in time of mobilization, and should be allowed by Congress, in the discretion of the President, to be called out for mobilization, or in time of war.

It will be observed that in the number of men heretofore considered the number of apprentices allowed (seven hundred and fifty) is not taken into account. The reason of this is, that this number is used as a margin for shortage found in nearly every ship from varying causes, the sick in the hospitals, and from the fact that only a portion of the seven hundred and fifty are in actual service in cruising vessels, one-third being the number actually so employed, and our subject is being considered from the point of resources we actually have.

TABLE VIII.

NATION.	Armored Ships.	Unarmored Ships.	Gun-boats.	Torpedo-Boats.	Men allowed.	Men in Reserve.
Austria	12	18	27	38	8,880	7,500
China	7	28	38	7	6,852	
Denmark . . .	7	6	8	. . . .	4,360	
France	59	136	59	130	75,915	150,000
Germany . . .	19	35	54	116	11,396	34,000
Great Britain .	80	123	183	246	58,142	55,000
Italy	20	41	29	82	17,316	14,000
Russia	31	51	54	138	37,280	22,000
Spain	13	76	76	26	26,902	6,700
Sweden	9	13	42	26	7,940	4,100
Turkey	14	49	22	. . . .	36,390	
United States .	14	22	6	2	7,500	

It may be said that the complements allowed are too small; but there is a tendency to overcrowd our ships, rendering everybody on board uncomfortable, without adding to their effectiveness, at least in peace times. Officers first serving in the new ships naturally want a large ship's company, but they soon find out the mistake and see their way clear to reach efficiency with a considerable reduction in the size of the crew. But, giving their view of large crews the preference in time of war, an increase of the number of enlisted men and boys would seem advisable to a moderate extent, and, with our present fleet of all kinds of vessels suddenly called upon to meet an emergency, I would fix the

numbers as follows: blue-jackets nine thousand, apprentices one thousand. This would give us all the men necessary for a defensive war, unless there be an increase of naval force not at present in sight.

An inspection of Table VIII. shows how very moderate in size is our enlisted force. It will also be seen that the foreign navies are strong in gunboats, which is not the case with us, and the large number of vessels that can be placed in commission with a comparatively small number of men is due to this fact, as in the cases of China, Germany, and Austria.

Inspection of Table VI. shows the number of line officers required to man the cruising fleet is two hundred and fifty-eight; to man the Eastern Squadron always in commission, thirty-four; the Western ships, twenty-two. Inasmuch as officers will be required to care for these battle-ships in ordinary, say four each, the grand total in service and under detail for mobilization would be three hundred and twenty-one, or about one-half the total number of commissioned officers borne on the Navy Register, which is seven hundred, of which number some are always sick. The remaining half would be needed, all of them, to properly care for and administer the naval stations, receiving-ships, and board duties. And there would be none to spare. The same remarks as to employment of enlisted men in work outside of legitimate naval duties would apply here. The number of officers now on what might be styled detached duty is larger than is generally realized, and a continuance of this system would be impossible, even should the fleet remain at its present moderate size. Let Congress see that all the officers now borne on the Register are needed for naval vessels, and it would provide other means for these important outside duties, or increase the *personnel*. Utilizing the officers we now have in legitimate naval work, it would seem as though the lists as they stand are large enough, especially in the grades of officers below flag-rank. As constituted, the different squadrons would call for six admirals in command of the cruising fleets, two in command of the two defense squadrons kept in commission. This number alone is in excess of those now allowed. Again, the navy-yards and stations need commodores to command them, and, with board duties of various kinds, that grade appears to be too small. The most ready means to accomplish this desirable increase is to fleet up the senior sixteen captains, making twelve admirals and twenty commodores. The agitation as to reorganization now heard would seem to offer a good opportunity to accomplish the change. The number of captains (thirty) remaining on that list would be enough to command the first- and second-rates.

While the question of the *personnel* of the commissioned officers of the navy may not, strictly speaking, belong to the question under discussion, the fact stares us in the face that upon its highest efficiency depends mainly the success of our fleet, and it cannot be passed by

without brief consideration. It is generally recognized in the service that the present stagnation in promotion is leading to a very serious condition of affairs, and also that the longer the official consideration of its remedy is put off the greater the disturbance will be when the remedy is applied. A little more than thirty years ago a condition in many respects similar confronted the service. Those officers in the service to-day who bore commissions at that time readily recall the result when the war-cloud burst in 1861. One year's war experience showed conclusively that radical changes must be made, and they were made, to the manifest improvement of the naval operations. It is to be hoped that past experience will profit as much and Congressional remedial legislation be found in the near future. It is also to be hoped that in such legislation we will be spared the trouble and heart-burnings likely to follow any remedy involving possible preferment through any means other than professional fitness. Make this standard as high as possible, but when it is decided that an officer *is in all respects* qualified to perform the duties of the next higher grade, give him his commission in the order of his standing on the list of his grade. The President has now ample powers of selection for command, which affords a wide scope to his discretionary appointment, when so advised by the Navy Department. But there can be no equity in promoting one officer over the head of another simply because the one happens to be so placed as to afford an opportunity for distinguishing himself, which it is his duty to do, while the other, not so fortunately circumstanced, does his appointed work equally well, though at a different scene of action. Spare the service the many ills sure to follow the enactment of selection pure and simple.

CHAPMAN C. TODD,
Lieutenant-Commander U.S.N.

MEMOIRS OF BARON DE MARBOT.

CONTAINED in the last will and testament of Napoleon, dated at St. Helena, is the following item: "To Colonel Marbot, one hundred thousand francs: I recommend him to continue to write in defense of the glory of the French armies, and to confound their calumniators and apostates." After the downfall of Napoleon, there were not lacking officers of his old armies who, hoping to please their new king, did not hesitate to criticise unfairly and unjustly the conduct of the campaigns in which they had recently participated. Among others, General Rogniart, in his work entitled "Considerations on the Art of War," asserted that Napoleon at Essling was outgeneraled by the Archduke Charles; that he was thoughtlessly drawn into a trap with part of his army on one bank of the Danube, while the archduke was planning the destruction of the bridge which was to separate his army into two parts with inadequate communications, and that the destruction of the army was only prevented by accident. To this work a comparatively unknown officer, Colonel Marcellin de Marbot, replied in a pamphlet, in which he so thoroughly disproved many of Rogniart's statements, and so satisfactorily showed the injustice of his criticisms, that the emperor, having read both works at St. Helena, placed in his will the item which attracted wide attention to the French colonel, whose name was thus placed among the many celebrated soldiers of the old army who were remembered by their emperor in his last days. Notwithstanding this bidding, Marbot wrote but sparingly; he prepared his memoirs with directions that they be not published until after his death. He died in 1854, at an advanced age. At his death so many years had elapsed since the times of the campaigns which he narrated, and the excitements and controversies engendered by the Napoleonic wars had so much abated, that for some reason the memoirs were not published in France until 1891, and were translated and published in London during the past year.

HISTORIES AND MEMOIRS OF NAPOLEON'S TIME.

There is probably no period in the world's history, of equal length, about which so much has been written as the period of French history from the execution of Louis XVI., in 1793, until the downfall of

Napoleon at Waterloo. The histories of this period and the memoirs relating thereto are almost innumerable. Yet a great portion of the writings are manifestly unfair, and written in a spirit of injustice to the author of the stirring events. The positions of the authors necessarily produced this result. Of the English historians, Scott and Allison were necessarily stirred with the living passions and prejudices of their nations, and to such an extent as to swerve the authors in their estimates and opinions on every page. Hazlitt is the only English historian of this period with even a semblance of fairness.

Of the French historians, Lanfrey was an advocate of the old *régime*, and so saturated with ideas of the Bourbon family and party that he sees nothing but to condemn in every act of Napoleon, and, if possible, his history is more unfair and bigoted than those of Scott and Allison. Of all Frenchmen, Bourrienne might perhaps have been best suited to have written Napoleon's history; but his dismissal for cause from his position has naturally tainted everything he wrote with unfairness. Moreover, Bourrienne saw Napoleon only as a statesman, never as a soldier. Of the numerous French memoirs many were written for a single purpose, and are without value to the general student. Grouchy's memoirs are a long-labored effort to prove that in being at Wavre instead of at Waterloo, on that eventful June day, he was following his technical instructions. Savary's memoirs have been adjudged as fulsome in their praise of the emperor, and, moreover, this author's connections with the execution of the Duke d'Enghien has prejudiced the world against him. Segur's memoirs are valuable and seemingly generally fair in criticisms, but they cover only a single campaign, the invasion of Russia. With the exception of the American author, John S. C. Abbott, and the French General Savary, there are no authors of the Napoleonic era who can be accused of writing in a spirit unduly eulogistic of Napoleon; the majority of the writers have written with hostile hands. Of all the French soldiers who participated in the campaigns of Napoleon, none had better opportunities to observe their plans and the brilliancy of their execution than Baron de Marbot, as will appear from an outline of the author's life.

LIFE OF MARBOT.

Born in 1782, Marcellin de Marbot was but eighteen when Napoleon had made the campaigns of Italy and Egypt, and by the *coup d'état* of the 18th Brumaire had established himself as First Consul of France. His father at this period was a major-general in the French army, and as such made the campaign of 1800 under Masséna. With his chief he was besieged in Genoa, and died in that city from the effects of a wound complicated with fever. At the commencement of this campaign young Marbot enlisted as private in the First Hussars, a regiment belonging to his father's command. Promoted to a lieuten-

ancy, he finished the campaign as an aide on the staff of Masséna, and, after enduring the horrors of that important siege, returned with the command to France. Marbot's next service was as aide on the staff of General Bernadotte; he was present at the first invasion of Portugal, in 1801. Transferred to the staff of Marshal Augereau, he served during the brilliant campaign of 1805 under that soldier's directions. Augereau's corps was not present at Austerlitz, the most famous of Napoleon's victories, but Marbot, having been sent with dispatches, joined the grand army a few days previous to that battle, and was present at the victory, serving temporarily as a personal aide to the emperor himself. He continued on the staff of Marshal Augereau until after the battle of Eylau, participating in all its victories.

The almost complete destruction of that marshal's corps at Eylau necessitated the transfer of Marbot to the staff of Marshal Lannes. As aide to Marshal Lannes, he was present at Friedland, Eckmühl, and Essling, where that gallant soldier was killed. As aide to Marshal Masséna, he was present at Wagram, and during the long and unfortunate campaign in Spain. At the commencement of the War of 1812, Marbot, who had reached the grade of major, was transferred to the line, and appointed colonel of the Twenty-third Chasseurs. As such he participated in the disastrous invasion of Russia, and, continuing as colonel of his cavalry regiment, he made the campaigns of 1813 and 1814, participating in all the important battles. At Waterloo, Marbot commanded a cavalry regiment in the corps of D'Erlon. In his military service Marbot was present at every important battle of the Napoleonic era, from Marengo to Waterloo; he was wounded thirteen times; he served under five different marshals, and was four times promoted on the field of battle. Present on the battle-fields of every country of Europe, from Spain to Russia, few had better facilities to observe the operations of the grand army.

EARLY RECOLLECTIONS.

From his position as son of a French general, the author in his youth met many of the men whose names were to become famous in history. At his father's camp of Le Miral, in 1793, were three men, serving in subordinate positions, whose names were to be known to the world; they were the three future marshals, Augereau, Murat, and Lannes. Lannes, then a lieutenant, took special notice of the eleven-year-old boy visiting his general's camp, and instructed him in riding and shooting. Reflectively, Marbot writes, "Little did we then think that he would one day be a marshal; that I would be his aide-de-camp, and that he would die in my arms at Essling." The story of the conspiracy of Bernadotte against the consular government, about which but little has been written, is told in all its details with all the cowardice and baseness of its author. Marbot and his older brother were

both serving as aides-de-camp on Bernadotte's staff. The brother, Adolph de Marbot, was given a package to take to Paris, being entirely ignorant of its contents. He was arrested on entering the city, and his package was found to contain Bernadotte's proclamations. The misfortune nearly ruined both brothers, for when, a few years after, Augereau, at a review, presented Marcellin to Napoleon for promotion, Napoleon asked him if he was the Marbot of the Rennes affair; answered in the negative, he exclaimed, "Oh, you are the good one, the Genoa and Marengo one. I make you a lieutenant." The emperor always disliked the brother, though unjustly. Bernadotte, with his usual treachery, succeeded in throwing the odium of the affair on two of his officers, and escaped punishment only to show himself a traitor in the Jena campaign. With all his ability, there are few men of the period for whom a greater contempt can be had than Bernadotte. The memory of the man who would turn his arms against the soldiers whose bayonets had raised him to the throne deserves the most supreme odium. The story of his disgrace at Wagram is told in words not before given. Notwithstanding his remaining at Auerstadt, within sight of Davoust's fighting columns, without taking any part, Napoleon employed Bernadotte in 1809, giving him command of the Saxon corps. He was continually complaining and faultfinding. The evening before Wagram he criticised the emperor's movements in the presence of a group of officers, and said that if he were in command he would, by a scientific manœuvre, have compelled the archduke to surrender. His remarks came to the ears of the emperor. On the day of the battle his corps was actually routed by the Austrians, and were falling back in headlong stampede on Masséna's corps, a disaster which, for the moment, put the battle in doubt. While in disastrous retreat, Bernadotte suddenly found himself face to face with the emperor; and Marbot, with the other aids of Masséna, witnessed the scene. "Is that the scientific manœuvre by which you were going to make the archduke lay down his arms?" was Napoleon's ironical observation. Bernadotte stammered a reply; the emperor stopped him, removed him from the command of his corps, and ordered him to leave the field. His conduct at Auerstadt had been actually culpable, but Napoleon allowed him to return to France unpunished, and finally allowed him to ascend the throne of Sweden. The truth is that Napoleon was magnanimous and generous throughout his whole career; if he had made a few examples of his relatives and friends, who, by disobedience of orders, were ruining his cause in the Spanish campaign, he might have checked the insubordination in the army, and have retained his throne. Marbot condemns in no uncertain terms the execution of the Duke d'Enghien, whose arrest he characterized as "a monstrous violation of international law," and whose execution he describes as "odious business." He avers that he was assured by many

people that General Savary, the governor of Vincennes, had told them that he himself ordered the execution, without waiting for the papers to reach Napoleon, in order that the emperor might be relieved from the embarrassment of acting on the sentence. Savary has denied having made the statement, but Marbot is positive that many witnesses could have been produced who would have established the fact that he did repeatedly make the assertion. Criticised as severely as it has been, the final decree of history must justify the execution of the duke, as a just retribution on the princes who had bands of assassins in their employ, seeking every opportunity to take the life of Napoleon. There is but one act in Napoleon's political life which I believe will remain as a reflection on his character, and that is his acceptance of the position of mediator between Charles IV. and his son, in order that he might overthrow them both. This whole affair Marbot justly stigmatizes as unworthy of so great a man. The many prominent men who were implicated in the conspiracies against Napoleon's life received from the rank and file of the army the loathing that their conduct deserved. This feeling of indignation was especially directed against Pichegru and Moreau, the most prominent men engaged therein. At the battle of Dresden, during and before the battle, it was rumored in the French ranks that General Moreau was serving in the Russian army. Marbot declares that the rumor was not credited, for the soldiers could not believe that he would join a foreign army to fight his native country, and would not believe that he had left America. The next day after the battle, as the French advanced over the battle-field, a greyhound was seen wandering aimlessly about; the collar bore the inscription "General Moreau's dog." It was only when this positive evidence of the presence of the man was procured that the army would credit the treason of the victor of Hohenlinden. His death in his first battle against France caused no regret.

CAMPAIGNS OF 1805, 1806, AND 1807.

The events of these three world-renowned campaigns are vividly portrayed by the author, who was present at all the battles. Many incidents are mentioned which never before have been recorded. Austerlitz, Jena, and Friedland are three strategical gems, not equaled by those of any other of the world's great captains. With Marengo they were reserved as the four battles where he gave complete personal directions; the names of all his other victories were bestowed as titles on his prominent generals when he created the dukes and princes of the empire. These four battles were alone reserved. In the campaign of 1805, the detachment of Mortier to the left bank of the Danube is criticised as a measure not consistent with military principles; and the criticism is sustained when it is considered that Mortier barely escaped destruction by the army of Kutusoff, and that when Napoleon

campaigned over exactly the same ground in 1809, he advanced on Vienna without repeating the manœuvre of detaching a corps to the opposite bank. He doubtless realized the mistake he had made in the former movement. If there was one subject more than another on which Napoleon would be adjudged over-severe by the present age, it was having his colonels bring the full complement of the men of their regiments into line for battle. No excuse for the absence of men would be accepted. Some might have fallen out on the long march; it was no excuse; and all colonels dreaded the reprimands sure to follow if the line of battle was formed with any absentees. Marbot relates an experience. The day before Austerlitz, Napoleon observed the Chasseurs of the Guard, and quickly estimated their number to be about eight hundred. Addressing General Morland, their commander, he told him that the strength of the regiment was nearly twelve hundred, and demanded an account of the absentees. General Morland protested that only about a hundred had fallen out on their long march from Vienna, which they had just completed. The emperor, leaving for another regiment, ordered Marbot to count the men and report. The count verified the emperor's estimate, but General Morland, dreading Napoleon's censure, begged the aide-de-camp to conceal some way the full number of absentees. Yielding to personal pressure, Marbot kept himself from Napoleon's presence on one excuse and another without definitely reporting the exact result, until the battle of the next day rendered any report unnecessary. After Austerlitz, Marbot was sent to Berlin with dispatches, and during his presence in that city witnessed the clamor of the war-party for hostilities with France; the Noble Guard going so far to show their zeal as to whet their swords on the stone steps of the residence of the French ambassador. This matter being reported to Napoleon produced the characteristic reply that they would find that the French swords needed no sharpening. In the retreat from Jena this entire regiment were taken prisoners, and a very complete revenge was taken by marching them through the streets of Berlin, special care being taken that their line of march passed the house occupied by the French ambassador. During the Jena campaign, the author, serving in Augereau's corps, witnessed a strange decree of fate produced by the hands of time. Augereau, in his adventurous youth, had served as a private soldier in the army of Prussia. In the retreat from Jena his corps captured the entire regiment in which he had formerly served. Now, so slow was the system of promotion in the Prussian service that Augereau found the same man serving as captain of his company that had been in that position during his service as a private soldier. The great change in the relative positions of the two men which a few years had produced can hardly be realized. Marbot writes very fairly the events of the great battle of Eylau; he seems neither to add nor detract from the

achievements of the French soldiers on that day. In fact, the entire work is characterized with a spirit of fairness and determination to present facts without attempt to unduly eulogize or unfairly detract. At Eylau the almost complete destruction of Augereau's corps, which bore the brunt of the battle in its early stages, is frankly admitted, but the Russians were, nevertheless, beaten and driven from the field. The work has not escaped being marred at the hands of the English translator, who has filled the work with his unfair notes. If the average English writers can establish the fact that the army opposed to Napoleon was not actually destroyed, he immediately tries to figure out a victory for the Frenchman's opponents. At Friedland, Marbot witnessed the brilliant victory as an aide to Marshal Lannes. It was he that was sent by the marshal to notify Napoleon of the crossing of the Alle by the Russians to give battle, and consequently he had the pleasure of riding in company with the emperor six leagues to the battle-field, and of witnessing his joyful mood as he called on the aide to witness that it was the 14th of June,—the anniversary of Marengo,—and that it would be a lucky day.

THE CAMPAIGN OF 1809.

The details of this celebrated campaign are related at greater length than the previous ones; owing to the fact that the author's personal share was greater, and his commands were more important. The campaign, opening with victory at Eckmühl, is a study in completeness of design and thoroughness of execution. Napoleon's genius still carries victory to his banners. In concentrating for the battle of Eckmühl, Davoust left one regiment at Ratisbon to secure the important bridge over the Danube; leaving the colonel—a relative—orders to hold the town, in case of attack, to the last extremity,—time being the important element. The colonel, however, surrendered the town, after Eckmühl, with a defense of an hour or two and with little fighting. After the defeat and rout of the Austrians, Marshal Lannes proposed to the emperor to pursue them hotly and enter Ratisbon with their fleeing columns; as the distance was only three leagues. The other marshals opposed the movement, owing to the fatigue of their troops. Napoleon seemed to hesitate. It was the beginning of hesitation in his character,—the beginning of hesitation which brought sure disaster. The Napoleon of the campaign of Italy, who abandoned Mantua at a thought and hurled himself on the advancing columns of Wurmser, never hesitated; the Napoleon who crossed the Alps and forced the battle of Marengo; the Napoleon of Ulm and Austerlitz and Jena and Friedland had no hesitation in his character. But the Napoleon of Borodino was in doubt about employing his guard, and listened to arguments for and against its use to complete the victory; this Napoleon was in doubt about giving battle at Leip-

sic; hesitated when the allies were marching on Paris; and was crushed at Waterloo. After Eckmühl, the decision was finally made not to pursue that night; and with the result that the next day the walled town of Ratisbon had to be carried by assault. The capture of Ratisbon, on that May day, reads like the pages from the history of the crusades, replete with achievements of chivalry. The emperor with the whole army stood as witnesses, outside of rifle range, while Lannes's corps performed the part assigned them. Marbot relates the work of preparation; the assignment of a small column of volunteers to rush forward and plant ladders in the ditches against the parapet; the defeat and recoil of the column; the advance and defeat of a second column, and then of the failure to receive response when a third column of volunteers was called upon to retrieve the failure of their former companions. Then the army witnessed a sight not soon to be forgotten. Marshal Lannes himself seized a ladder, and started for the walls. At this encouragement a wave of enthusiasm swept over the corps; his aides restrained their chief, and with the assistance of willing volunteers seized ladders and rushed forward. Marbot relates his share sufficiently to explain the parts, and then allows a contemporaneous writer to finish the description. With another aide,—Labédoyère, who was afterwards included with Ney in a death sentence, as a victim of Bourbon revenge,—he was first to cross the ditch and plant two ladders against the parapets. When partly up the ladders, Marbot says that Labédoyère asked him to give him his hand to steady him as he found that the bottom of his ladder was not secure. Pelet, in his work on the campaign of 1809, describes the scene: "Marshal Lannes seized a ladder and was starting to fix it himself; his aides-de-camp struggled to stop him. At the sight of this generous contest the mass of our soldiers fell on the ladders, caught them up, and crossed the intervening span, preceded by the aides-de-camp. In the twinkling of an eye the ladders were fixed, the ditch was crossed. On the top of the first seen to appear, holding each others hands, were Labédoyère and Marbot; the grenadiers followed." It was while watching this assault that the emperor was wounded; it being the only wound he was known to have received in battle; although his body after death showed several distinct wounds.

At Essling, Marbot witnessed a scene between two marshals which has not been before related. Bessières, in command of the guard, had been placed under the orders of Lannes; in the evening, after the battle, they became involved in a dispute over the wording of an order sent to the former by the latter, which resulted in both marshals drawing swords; and bloodshed was only prevented by the prompt interference of Masséna. It was the beginning of the quarrels, jealousies, and insubordination which later reached such a height among the marshals, and which was productive of such disastrous results. These

memoirs very effectually dispose of many of the myths of Scott and other historians. A favorite of these writers has been a story to the effect that Lannes, after his wound at Essling and during his interview with the emperor, upbraided the latter for his ambition, and urged him to stop wars, which Lannes was made to pronounce as unjust and unnecessary. Marbot avers that when the emperor met the marshal, who was being carried to the rear, and where the interview took place, that he was himself holding and supporting the marshal's head. He asserts that Napoleon was deeply affected at the misfortune of his friend, whose blood at his embrace stained his white uniform; but that Lannes was actually cheerful, and was already canvassing the matter of procuring an artificial limb, having no thoughts of death. Not one word of reproach was uttered; the story of Scott having been the product of his own imagination. Before leaving the Wagram campaign, the author devotes considerable space to the fame of an unknown soldier, who, if fortune had favored, would have risen to high commands and his name been known to the world. Colonel Charles de Sainte Croix, on Masséna's staff, very favorably attracted the notice of the emperor. His achievements in command of cavalry troops were remarkable. It was he that led the advance at the crossing of the Danube before Wagram. Napoleon, in the presence of several officers, promoted him to the rank of general, and said, "He reminds me of Marshal Lannes and General Desaix; and if he is not struck down, Europe will be astonished at the distance I will take him." Every one expected he would be a marshal; but, unfortunately, he was killed a few months later before the walls of Lisbon.

THE CAMPAIGN IN SPAIN.

On the staff of Marshal Masséna, the author follows the events of the war which was so unfortunate for France. At Busaco he witnessed the never-ending disputes between Masséna—the commander-in-chief—and the marshals and generals in command of corps. The conduct of Reynier is especially condemned as deserving exemplary measures. Among other reasons, the principal one assigned for the failure of the French arms and the success of the English in Spain, was the superiority of the English at the time in marksmanship, resulting from target practice; an exercise which at that period had not been thought necessary in the armies of Europe, outside of the English. This observation gives lessons for the present as well as for the past. The use of thoroughbred horses by the English is also mentioned approvingly. While the English, owing to the cost, did not mount any regiments with thoroughbreds, they employed large forces of "runners," who, mounted on thoroughbred horses, would approach the lines or columns of the French, just keeping out of range, and coolly examine their enemies. When chased, they would ride across country

and easily distance any pursuers. Marbot suggests how useful such a force would have been to Napoleon, examining the country on his right on the day of Waterloo. The question of the employment of select regiments of cavalry at the present day, mounted on superior thoroughbred horses, is one that will receive consideration.

THE INVASION OF RUSSIA.

With the beginning of 1812, the spirit of the author seems full of bitterness, not towards his enemies, but towards the many leaders of the French, who, through incompetency and treachery, were ruining the cause of the empire. As colonel of the Twenty-third Chasseurs he accompanied the army in this great invasion. The conduct of Jerome Bonaparte, after the crossing of the Niemen, where his incompetency prevented the destruction of the Russian army of Bagration, receives the severest censure. And yet, what could be expected of Jerome. The crown of Westphalia did not make him a general; the name of Bonaparte did not qualify him for an independent command. Junot, who replaced Jerome, through unwillingness to receive orders from Ney, lost the chance of the campaign of enclosing the army of Barclay de Tully in a defile and securing its destruction. Every one expected, says Marbot, to see Junot severely punished; but the early affection of the emperor interceded in his behalf; and he was only removed from command and allowed to return to France,—another illustration of the generous nature of Napoleon, but also of his weakness in selecting incompetent men for important trusts from motives of personal friendship. At the Beresina, Marbot's corps left the main centre and advanced on Poltosk, and, consequently, was not present at Moscow. These divisions, however, fought the great battles of Poltosk, where Saint-Cyr won a marshal's baton. As the season advanced and the cold weather approached, Marbot, with several other colonels, began preparations for their regiments, which later saved them from the terrible suffering endured by the army. They commenced by repairing and operating the mills and distilleries of the country with details of soldiers who manufactured large quantities of flour and brandy. Then all the cattle of the country were collected into regimental herds; and, finally, Marbot required every one of his men to provide himself with one of the peasant's sheep-skin coats, which were easily procured. These precautions saved many lives. The great disaster at the passage of the Beresina, where the reunited columns of the French forced a passage, is known to all. The account of the difficulty of construction of bridges without equipage, the sufferings of the men and the attack of the Russians while the crossing was in progress, have been written and rewritten. Marbot avers that, during the entire night of November 27, the bridges were actually clear, while a crowd of stragglers were encamped on the Russian side. He says

that duties called him to the east bank, and that he witnessed all this, and reported the deplorable waste of time to his marshal,—Oudinot; and received only an indifferent reply. The next day between twenty and thirty thousand of these wretched men perished after the destruction of the bridges. It is unaccountable how such a state of demoralization could have existed. The loss of the grand army during this campaign, while enormous, are declared greatly exaggerated. A "state," with notes in Napoleon's hand, seen in the possession of General Gourgaud, stated that one hundred and fifty-five thousand French and one hundred and seventy thousand allies crossed the Niemen. Of the French, sixty thousand recrossed; leaving ninety-five thousand missing. Of these, thirty thousand prisoners returned home after peace, leaving an actual loss to the French, by death, of sixty-five thousand. The losses in Marbot's own regiment are exactly given. He started with one thousand and eighteen men, and received thirty recruits. There were killed one hundred and nine, captured seventy-seven, maimed sixty-five, and missing one hundred and four, making a total of three hundred and fifty-five men; he was, therefore, able to muster in February, 1813, six hundred and ninety-three mounted men. It is true that the Twenty-third did not go to Moscow; but the advance to Poltosk was nearly as far; and their engagements with the enemy nearly as many as those of the main column. This muster, having been doubted by the emperor, was verified by General Sébastiani, after which a testimonial of satisfaction was sent to their colonel. The events of 1813, leading to Leipsic, and the defense of France in 1814, are related in a spirit of sadness by the author, whose mind is weighted with his country's misfortune. After the disaster following the destruction of the bridges at Leipsic, the author closes his description of the battle in despair; not having the heart to tell the extent of the misfortune. In the last campaign, the genius of Napoleon seemed to return; and at one time it looked as though his feeble forces would drive the armies of Europe from the borders; one effort of the nation was all that was needed. The result, however, showed too many jealousies and too much treason to have made success possible.

CAUSES OF NAPOLEON'S FALL.

The causes of Napoleon's downfall are many, and different writers assign to different ones the principal reason for the destruction of the empire. The commencement of a war with Russia, while the war in Spain was not completed, must stand as one of the leading causes. The defective organization of the army for the invasion of Russia was another; for no one can ever claim that this army was properly organized. But the greatest of all reasons for Napoleon's failure, and the greatest weakness of his character, was, I believe, his employment of thoroughly incompetent relatives and personal friends for important

commands. One great ambition seemed to be to make generals of his brothers. His attempt was a lamentable failure. Leclerc, his brother-in-law, who had never given evidence of any military ability, was given the command of the army for the expedition to St. Domingo; result, the loss of the entire army. Joseph was placed in command of the army in Spain; result, the crushing French defeat of Vittoria. Jerome, in command of a corps in Russia, proves to Napoleon's eyes his incompetency; a fact which the army had known for years. The appointment of Eugene Beauharnais to the command of the army of Italy, in 1809, with MacDonald as personal tutor, is a strange enigma; he had actually no experience as a soldier with any command. Then the assignment of important commands to such men as Junot, Marmont, and Oudinot was enough to ruin any cause. The great mistake of Napoleon was his unfortunate selections. Of these unfortunate selections Marbot cites many instances.

Unfortunately, the author stops with the first overthrow of Napoleon, and gives no account of the campaign of Waterloo, an omission much to be regretted, as the reader would gladly have read his observation on the great battle in which he participated. The memoirs of Marbot are a valuable addition to the literature of the Napoleonic era, and will take a place among the most intensely interesting literary productions that have appeared relative to the rise and fall of the soldier who could say, like Mohammed,—

> "I was ambitious,
> But never did king, pontiff, or citizen
> Conceive a project as grand as was mine."

EVERARD E. HATCH, *U.S.A.*

NARRATIVE OF A FIRST CRUISE.

(Continued from page 472.)

HAVING disposed of Alvarado, the commodore next directed his attention to Tuspan. Here a very different state of affairs existed, which meant hard work, and plenty of it.

The bar at the mouth of Tuspan River was a very dangerous one, and the river itself very tortuous. The Mexicans, quick to take advantage of these natural barriers to the approach of an enemy, had very skillfully and scientifically located several forts on the banks of the river, commanding vulnerable points of attack, and were prepared and determined to make an heroic resistance to our advance,—as, in fact, they did. They had mounted the captured guns of the "Truxton" on a fort just above the town, from which we frequently heard as we advanced.

It was about the 15th of April that the squadron came to anchor off the bar at the mouth of the Tuspan River, and immediate preparations were made for the attack on the town. The steamers had their masts removed, and everything else that could be spared from the vessels, so as to insure their crossing the bar in safety; this accomplished, we got under way, and soon anchored safely inside. The "Spitfire" touched once in crossing, but without damage.

The little fighting fleet was organized without delay for the attack; and about noon on the 18th of April, with "all hands at quarters," we got under way and headed for Tuspan, with

> "Cannon to the right of them,
> Cannon to the left of them,
> Cannon in front of them
> Volleyed and thundered;
> Boldly they rode and well."

* * * *

Notwithstanding this, "*Onward*" was the command. The officers and men had become veterans, and were as steady as rocks under the enemy's fire. Tuspan soon fell, adding another to the list of naval successes.

This expedition cost us dearly in killed and wounded, Captain Tatnall among the number. He received a gun-shot wound in the

wrist. I happened to be looking towards him at the moment. Commodore Perry said, "Captain, you had better go below." "No, sir; not until the fight is over," and he remained on deck.

As soon as the fleet got abreast of the town, and the landing party safely on shore, the vessels came to anchor. In the mean time, Captain Tatnall had gone to his cabin, and Dr. Thornley was dressing his wounded wrist. I went to the cabin and found the captain lying on a sofa and groaning terribly with pain. I remarked, "Captain, I am very sorry, sir, that you are hurt, and suffering."

"Oh, yes," he replied, "I am suffering very much. But, my God, sir, I would not take twenty thousand dollars for it!" In the end it proved to be a priceless wound. It gained him a vote of thanks and a beautiful sword from his native State, Georgia, a compliment that thousands could not have otherwise purchased.

From Tuspan the fleet returned to the anchorage at Sacrificios Island. It was here, and at this time, that Captain Tatnall received Dr. Thornley's report of the casualties of the "Tuspan expedition," in which occurred the following: "Captain Tatnall, slightly wounded!" "What! slightly wounded? Could a slight wound give me such agony as I have endured?" In vain the doctor tried to explain "how a wound could be slight and yet very painful." But it availed nothing. The old gentleman was furious. Thornley's professional vertebra was of hardened steel, and could not be deflected, and the report stands to-day as it was originally made. This affair, however, came near having a very serious ending. The captain had determined to challenge the doctor; but, happily, better counsel prevailed, and the matter was dropped. I heard of the captain's intention through his son Joe, who, about that time, came to me one morning and said, "My God, Shock, father is going to challenge Dr. Thornley!" It was not long before it was generally known on board the vessel.

This Tuspan expedition was the last on which I served in the "Spitfire." The commodore detached and ordered me to the "Mississippi."

"UNITED STATES FLAG-SHIP 'MISSISSIPPI,'
"AT SEA, OFF VERA CRUZ, April 24, 1847.

"SIR,—Tuspan being the only fortified place of importance situated on the gulf coast not in our possession, and conceiving it to be a point of honor as well as duty to reclaim the guns taken by the enemy from the wreck of the 'Truxton,' and mounted with others for the defense of the river and town, I determined on attacking it, and left Sacrificios in this ship for that purpose on the 12th inst., having in tow the steamers 'Spitfire,' 'Vixen,' and 'Scourge,' and the gunboats 'Bonita,' 'Petrel,' and 'Reefer,' with a detachment of three hundred officers, seamen, and marines from the 'Ohio,' distributed in this and the smaller vessels. On the following day we arrived at Lobos, the appointed

place of rendezvous. The 'Raritan,' with a detachment of one hundred and eighty officers, seamen, and marines from the 'Potomac,' added to her own complement. The 'Albany,' 'John Adams,' and 'Germantown,' with the bomb-vessels 'Vesuvius,' 'Etna,' and 'Hecla,' had been previously dispatched for Lobos, where they arrived in good time, and were subsequently joined by the 'Decatur.'

"On the 15th all the vessels left Lobos for the anchorage under Tuspan reef, but were separated during the night by a norther. Having again concentrated on the morning of the 17th, the whole of that day was employed in lightening the small vessels, in sounding and buoying the channel of the bar, and in other preparations for ascending the river.

"The following morning (the 18th) the bar was safely crossed by the steamers and gunboats, with about thirty barges, filled with detachments from the different vessels anchored outside, having with them four pieces of artillery.

"After crossing the bar I hoisted my flag on board the 'Spitfire,' and immediately led up the river to the attack, the steamers having the gunboats and barges in tow until we got into the range of fire of the enemy, when I ordered them to cast off; the gunboats to follow up the river under sail, and the detachments in the barges to land with the artillery and storm the forts and town. These orders were executed with extraordinary rapidity, while the flotilla continued its course up the river, and driving, by the well-directed fire, the enemy from his defenses.

"The dispositions of the enemy for defense were judicious. They consisted of two forts on the right and one on the left bank of the river, with positions well selected for commanding the reaches of the stream. They had seven guns mounted, and detachments of infantry firing from the forts and the thick chapparral along the margin of the left bank.

"General Cos, chief of the windward military division of the Mexican army, was in command, and had with him, as is believed from the evidence of his order-book, about six hundred and fifty rank and file.

"But if the dispositions for defense were judicious, the defense itself was feeble; though had it been more obstinate, the result would have been the same, for I cannot exaggerate the intrepidity of our officers and men, or say too much of the spirit that animated them.

"The 'Truxton's' guns were brought off, and the others destroyed. The forts were also destroyed.

"Our loss in the attack has been small,—fourteen killed and wounded. The inclosed papers, lettered A, B, C, and D, will furnish all necessary details.

"The 'Albany' and 'Reefer' have been left to watch Tuspan. The

'Hecla' is ordered to blockade Soto de la Marina, the 'Etna' to occupy the river Tobasco, and the 'Vesuvius' and 'Porpoise' the port of Laguna, while the 'Germantown' is scouring the coast north of Lobos.

"My next expedition will be to the eastward to gain possession of Guasacoalcos, and the small ports between Alvarado and the Tobasco. These in our possession, or blockaded, the enemy will not have a nook on this coast into which supplies can be received.

"I have already commenced the organization of a corps of two thousand five hundred officers and men, with ten pieces of light artillery, to be in readiness for landing, to make a diversion in co-operation with the land forces, should it be found expedient to do so.

"I am, sir, with great respect, your obedient servant,

M. C. PERRY,
"*Commanding Home Squadron.*

"THE HONORABLE JOHN Y. MASON,
"*Secretary of the Navy, Washington, D. C.*"

"U. S. STEAMER 'MISSISSIPPI,'
"OFF TUSPAN BAR, April 22, 1847.

"SIR,—I have to report the following list of killed and wounded in the action of the 18th instant,—viz.:

"KILLED.

"Lewis Clayton, seaman, of the U. S. ship 'Ohio.'

"Antonio Francis, seaman, of the U. S. ship 'Decatur.'

"John Griffin, seaman, of the U. S. ship 'Raritan;' was murdered by the rancheros on the 19th instant.

"WOUNDED.

"Commander Tatnall, of the U. S. steamer 'Spitfire;' flesh wound of right wrist.

"James McCann, seaman, U. S. steamer 'Spitfire;' severe wound of right elbow-joint.

"Flag Lieutenant James L. Parker, U. S. steamer 'Mississippi,' aide to the commodore; severe wound of upper part of left breast.

"Lieutenant Whittle, U. S. ship 'Ohio;' flesh wound of right leg.

"Lieutenant Hartstein, U. S. brig 'Hecla;' flesh wound of right wrist and thigh.

"Hiram Townsend, ordinary seaman, U. S. ship 'Potomac;' severe wound of right thigh.

"Andrew Sweeney, seaman, U. S. ship 'Germantown;' flesh wound of left shoulder.

"Henry O. Hart, boy, U. S. ship 'Germantown;' slight wound of right cheek.

"James McCullen, boy, U. S. steamer 'Mississippi;' slight wound of right hand.

"Commander Mackenzie, U. S. steamer 'Mississippi;' wounded in left foot while on duty on the 19th, accidentally.

"John Monroe, seaman, U. S. steamer 'Mississippi;' severe wound in left hand, with loss of thumb, while on duty at guard-house on the night of the 21st.

"It is with pleasure I inform you that the above wounded are doing well.

"Very respectfully your obedient servant,

"SOLOMON SHARP,

"*Surgeon.*

"TO COMMODORE M. C. PERRY,

"*Commanding Home Squadron.*"

The expedition against Tuspan consisted of the following force, all under the command of Commodore M. C. Perry:

The steamer "Spitfire," Commander J. Tatnall.
The steamer "Vixen," Commander J. R. Sands.
The schooner "Bonita," Lieutenant Commanding T. G. Benham.
The schooner "Petrel," Lieutenant Commanding T. D. Shaw.
The schooner "Reefer," Lieutenant Commanding Thomas Turner.
The steamer "Scourge," Lieutenant Commanding S. Lockwood.

Tobasco was an important point, second only to Vera Cruz. It was defended by one of Mexico's bravest officers, and it required no little trouble and hard work to take it, but the inevitable was at hand. On the 15th of June, 1847, Tobasco fell after an heroic and stubborn defense, and with its fall was brought to a close the work of the navy in the Mexican War on the Atlantic side. At the conclusion of our work at this point we returned to our anchorage off Vera Cruz.

The "Mississippi" had been under way or at anchor under steam, with banked fires, for nearly a month, and as a result the heat of the ship was oppressive, and that of the air almost overpowering. At last the yellow fever made its appearance in the squadron, and I was among its first victims. In anticipation of the appearance of sickness, the commodore had ordered the construction of a hospital on one of the adjacent islands. It was built by the carpenters of the squadron of rough boards, and though a rude affair, it was the best that could be done under the circumstances, and was quite good enough to die in. One end was partitioned off for the officers, and the remainder devoted to the use of the men. To this delectable spot I was taken with others suffering with the yellow fever. The doctors were untiring in their attention, and all that professional skill and kindness could accomplish was done for the comfort and restoration of those who had a chance for life, and, as far as possible, to comfort the dying, of which there were not a few.

On the night of the day we were sent to the hospital the "Missis-

sippi" caught on fire from spontaneous combustion in her coal-bunkers, and was only saved by the greatest efforts.

A few days after we had found lodgment in the hospital, Commodore Perry came on shore, and, with a kind word for men and officers, made an inspection of the place, as fearless of the contagion as he was of the enemy's guns. In passing he approached my cot, and, extending his hand, said, "I hope, Mr. Shock, that you will soon be better and able to return to the ship." This was a surprise to me, as I had no idea that a man having such vast responsibilities resting upon him remembered I was on board his ship, much less to remember my name, especially as I had made it a rule to keep at a respectable distance from him. If I happened to be on deck taking a "constitutional," and he came out of his cabin, I invariably disappeared. This timidity, I think, was the result of my first impressions. Shortly after I had joined the ship something provoked him, and, as he came on deck, he saw an officer doing something he did not like, and he gave one bellow, the sound of which I never forgot.

I never joined the ship again. A medical survey having condemned me, with several other officers, as unfit for further service in the squadron, we were sent home.

A number of ships belonging to the squadron were ordered home at that time, in which we were to take passage; those of the sick and convalescent who still required medical attention were assigned to vessels having medical officers attached; one, or perhaps two, were store-ships and had none. I was assigned to the sloop of war "Albany," Captain Breese in command.

HOMEWARD BOUND.

Among our passengers was Captain Mayo, whose excellent management and personal bravery at the naval battery in front of Vera Cruz on the memorable 24th and 25th of March, 1847, is still fresh in the memory of the living, and for which history will do him justice.

Surgeon Ninian Pinkney was senior medical officer of the ship, and among the most distinguished in the profession. I knew him well,—we were from the same State, the same city. Ninian was peculiar, *very* peculiar in many things. I may say (outside of his profession) that he was peculiar in everything but dying; in this he was compelled to follow the example of his ancient and illustrious ancestor Adam, and simply stopped breathing. Pinkney was a student in gastronomy as an art, and I have no doubt, as a pupil, had sat at the feet of Brillat-Saverin. In his moments of deep meditation he seemed to soar far above things of earth, earthy, and lose himself in the immensity of space. We had known each other many years, yet when we met, which was frequently, an introduction seemed necessary before I was recognized and remembered. In the course of time I got tired and put a

stop to it. Notwithstanding his peculiarities, he was a capital fellow, an excellent officer, and was highly esteemed in the squadron, and especially so by his messmates.

The fatigue consequent upon my getting on board the "Albany" completely prostrated me, and for some time I was quite ill. Pinkney gave me his immediate attention, and in a short time I was convalescent.

The "Albany" was flying light, and, as was well known, extremely tender. There were attached to her some of the best sailormen in the navy.

Our run to Havana was long and tedious; "light air" and head winds made up the weather record. On leaving Havana we had better luck. Soon after leaving the harbor we took a slant of wind on our starboard quarter and held it for several days, and made a capital run to the Capes of Virginia; here we met a northwester, which drove us off to sea for a couple of days; finally, however, we reached Norfolk. I left on the first boat for Baltimore, and reached home with shattered health and five dollars in my pocket over and above immediate demands. I had been home a few days when I received the following letter:

"NAVY DEPARTMENT, August 11, 1847.

"SIR,—Your letter of the 7th instant reporting your return to the United States under a medical survey has been received. Leave of absence is hereby granted to you for three months from this date, at the expiration of which you will report to this Department.

"I am respectfully yours,

"J. Y. MASON.

"MR. W. H. SHOCK,

"*Third Assistant Engineer, U. S. Navy, Baltimore.*"

Some one has said that there is a "silver lining to the darkest cloud." It is a beautiful thought,—so poetic in conception, so sublime in expression. I presume it was given to the world as an encouragement to the faint-hearted one, to tell him of the "eternal fitness of things," of an "ever-present compensating power that will adjust all inequalities"—if you live long enough.

Allegorically speaking, this silver lining (rather gossamer-like, it is true) flashed upon my vision before my three months' leave had expired. It made its appearance in the shape of a letter from the Treasury Department advising me of the fact that I was entitled to "eighteen dollars prize-money," growing out of the war with Mexico! The amount was small, it is true, but I found consolation in the fact that the government's share was a victory of its arms and a golden empire.

W. H. SHOCK,
Chief Engineer U.S.N.

(To be continued.)

IMPORTANT PRACTICAL NECESSITIES IN MILITARY SIGNALING.

It is not to be questioned that rapid communication is essential to successful military operations. It is equally evident that such communication must at the same time be accurately conveyed. Among the essential requirements of success these two are especially important, —viz., rapidity and accuracy. The best system of instruction to secure these results and the most practical form of apparatus to aid in the accomplishment should be adopted by the military. Signaling in some form has always been employed by both military and naval forces throughout the world. In fact, all language is but the assembling of signs and symbols for the purpose of conveying information between the members of the human family. Each language is really a code of signals, and they vary largely in the number of elements used. It is said that the peoples of the world employ nearly three thousand such codes in the ordinary affairs of life. This enumeration does not include the great number of extemporized codes for commercial purposes, to say nothing of those employed for miscellaneous uses. Every sound of the human voice and every motion of the body may be considered a signal. It is equally true of the sounds and motions of the whole animal kingdom. Signaling, then, is coeval with the birth of the human race. It has developed through the influence of civilization and invention.

All codes of signals and all methods of signaling have the same general object in view,—viz., to communicate intelligence with the least delay and with the greatest degree of reliability.

To increase the opportunities for communication a great variety of apparatus is employed. The various professions and industries have developed means of communication especially suited to their necessities. The formation of codes is practically illimitable, as the elements for their construction are equally boundless. How indispensable are special methods of signaling to the operations of the enormous railroad interests of the world! Equally so the commercial, marine, and naval interests. What a vast system of signaling has been developed in the growth of the electric telegraph, telephone, and water cables, by which

all parts of the earth are brought into marvelously close relationship! Signaling for military purposes is necessarily coeval with the practice of all methods of warfare from the earliest ages. There has been gradual but constant improvement in the means of communication.

It early became necessary to establish communication between distant points with more celerity and certainty than was possible by the employment of mounted or foot messengers. The readiness with which a fire could be started, the great distance to which it could ordinarily be seen, its simplicity and economy, first directed the attention of the ancients to this means of signaling. It is probable, then, that night signals were earliest employed for military purposes, followed later by those of a more complicated nature for day communication. From a beacon signal conveying but a single meaning, advance was quickly made to the use of a torch, by which a number of messages could be transmitted.

About 200 B.C. the Greeks employed a very ingenious torch with an attachment for measuring the time intervals of the given signals, which appears to be the first evidence of the use of chronosemic signals, so long and so well known to the armies and navies of the world in modern times.

It is known that Cæsar employed night signals during his campaigns in Gaul, which probably explains the rapidity of his movements and the skill with which his operations were planned. There are still in existence in certain parts of Europe, especially in France, towers of heavy masonry which were erected by the Romans as permanent signal telegraph-stations. During the seventeenth century there were occasions when commanding officers attempted to establish communication by a combination of artillery firing and volleys of musketry between the different corps of their armies, or between the army and troops in besieged places. The first Napoleon derived great advantage from the employment of semaphoric signals, and under his orders lines were run in all directions from Paris.

Semaphoric telegraph-lines were established in France in 1790; Sweden, 1795; England, 1796; Denmark, 1802; Prussia, 1833; Austria, 1835; and in Russia in 1839. Signaling in some of its various forms has been employed by the American army since its establishment.

The War of the Rebellion saw the organization of the first military body of which there is any record whose exclusive object was the study and development of means of rapid communication for military purposes, but yet it is quite evident from the foregoing brief historical sketch that military signaling is not of comparatively recent origin, as some suppose.

In the development of improved apparatus and methods for rapidly collecting and distributing information by signals, considerable has been accomplished. The electric telegraph and telephone have materially

assisted in this work, and much is yet to be realized from their further practical application.

The organization of a special signal corps gave impetus to the devising and construction of new apparatus and to the more extended and technical instruction of officers particularly fitted for signal duties.

While these facts seem favorable to the maintenance of a permanent staff corps for signal duty, yet the line has shown its entire capability of conducting the most important operations in visual signaling, in addition to other duties, making preparations to manipulate the latest contrivances in a short space of time.

The object of this paper is to consider briefly but comprehensively the nature of signaling, the scope of the art, its application to military uses, and, finally, what is believed to be some of the most essential requirements to success in its employment for military purposes.

Since the introduction of the heliograph, or sun-flashing signal apparatus, there has been a growing tendency to the practice of what is known as long-range signaling.

The heliograph is a novel and very interesting device for signaling, and the operator is nearly always enthusiastic over the opportunities developed by the simple but peculiar power of the instrument in reflecting sunlight and throwing an image of the sun a long distance. To those who have not studied the phenomena attending the reflection of sunlight, first experiments with the heliograph cannot fail to be attractive, especially the great distance, under favorable atmospheric conditions, at which the flash can be seen, bright and distinct as a planet. The fact is so unique and unexpected when realized as the result of experiment, with an apparatus by which the flash can be made to appear and disappear, so as to represent words, that the judgment is liable to fall captive to the imagination in forming an estimate of its practical value.

Experience should soon establish the fact that the utility of the simple heliograph is greatly circumscribed by the rigorous necessity of two conditions which seldom prevail together for any considerable period of time, especially in the greater portion of the United States, or of the entire globe for that matter,—viz., the presence of sunshine and the absence of obstructing atmospheric media between the points of communication.

Equipped with the necessary apparatus and stationed at the requisite elevation, with favorable atmospheric conditions, *long-range* signaling by sun-flashes becomes a very simple matter. The distance the flash can be thrown under necessary and favorable circumstances is practically without limit. A little consideration of certain facts will make this statement apparent. Solar light reaches the earth after traveling about ninety-two million miles. Striking a mirror simply alters its course, bends the rays in a new direction, but makes little

difference as to their energy. A practical illustration of the fact is given by the moon, which projects the sun's rays to us from a distance of over two hundred and thirty thousand miles.

Concerning the origin of the heliograph, it may be said that the knowledge of the potency of sunlight as a signaling agent is at least as old as Alexander the Great, whose fleet is said to have been piloted along the Persian Gulf by flashes from mirrors. The Russians made use of sun-flash signals during the siege of Sebastopol, in 1854–55, at which time the apparatus was known for military purposes as the "mirror telegraph." The heliotrope or heliostat has been in use in this country, and especially in Europe, in geodetic surveying for more than a century, and the maximum distances in transmitting the flash obtained, as against all records for military purposes.

The present form of the heliograph was developed by the English in East India in 1869, and became known to the American army in 1875, through the Signal Service School of Instruction at Fort Whipple (now Fort Myer), Virginia.

There is no question as to the power of the heliograph for long-range work, but, on the contrary, there is considerable question as to the advisability of confining it to such employment. It must be conceded by all who have had considerable practice in sun-flash signaling that the heliograph cannot be more than an auxiliary instrument supplementing the operations of other and more reliable appliances and methods, such as the flag, chronosemic sound signals, the electric telegraph, and the telephone.

The majority of all forms of signal apparatus are practically restricted to *short-range* work,—that is, to distances between three and twenty miles. The heliograph and heliostat have been effectively employed over ranges up to nearly two hundred miles. The oil lantern, the electric light, the magnesium light, and the oxyhydrogen light have proved efficient under favorable atmospheric conditions over ranges varying from five to nearly seventy miles.

Signaling over short ranges is necessarily more frequent because invariably more certain than where extreme distances intervene between stations, and, moreover, the means employed generally involves the simplest construction and the least expense.

Long-range apparatus is better adapted to scientific work, for the reason that its requirements can more readily conform to the difficulties of long-range communication, by taking the necessary time and means to overcome them. Scientific work demands that the signaling apparatus shall be effective at the greatest distance attainable, irrespective of time, labor, and expense. Military work, however, requires that communication shall be established and maintained in the shortest possible time, and with the least expenditure of labor and money. The conditions here imposed by the two classes of work necessarily

distinguish two sets of apparatus, and assign to the military those designed for short-distance communication.

The requirements of signal apparatus for military purposes demand certainty of successful operations under ordinary conditions of weather, night and day, and such simplicity of equipment as will secure completeness, portability, and the best quality of material and construction. Uninterrupted communication must be provided for. If a long range becomes available, it should be so subdivided with intermediate stations as to insure the transmission of messages whether the sun shines or not, and at all hours of the day or night.

The range for unfailing communication varies with climatic conditions, and should be determined by careful experimental work for different parts of the country.

It is not to be denied that communication by visual signaling over great distances would be valuable for the army; quite the contrary. There are times when the military can afford to build high towers or submit to the delay necessary to occupy great elevations for the purpose of securing favorable opportunities for long-distance communication, but the conditions under which such preparations would be made are exceptional, and, moreover, the most elaborate arrangements might easily be defeated by unfavorable weather at the critical moment, because too long a range had been attempted. The military are not in pursuit of the exception, but demand the rule that will guide them under the most unfavorable conditions, and therefore obtain results which can be relied upon with certainty in emergencies.

The question then presents itself, what should constitute the equipment of a signal station, and what should be the limit as to distance between stations? As to the equipment, every argument for safety and success points to the necessity of flags, mirrors, lanterns, torches, telescopes, binocular glasses, and compasses. As to the range, it appears prudent to fix the ordinary limits of signal stations at the maximum distance due to the apparatus of *least range* power, which is undoubtedly the flag for day work and the torch for night signals. By such an arrangement a total collapse of work can seldom if ever occur.

The optical telegraph for military purposes cannot prove successful while made to depend upon the caprices of the weather; but in its proper sphere it is an assured success, and quite indispensable to operations with troops in the field. The celerity and success of communication, while in a measure dependent upon the skill and zeal of the signalers, is yet more largely influenced by the kind of apparatus employed, the character of the weather, and the distance between stations.

The more clearly and concisely the signals can be seen, the fewer mistakes and accidental losses of time will occur, and the greater will

be the rapidity attained. Well-drilled operators will carry on signaling through intermediate stations at short ranges with greater accuracy than at extreme ranges, other things be equal. The greater the range, the greater the magnitude of any error resulting from defective manipulation of the apparatus. The constant interruption and errors at long range will outweigh any loss in time incident to the maintenance of intermediate stations.

When the extension of the optical telegraph becomes impracticable from any cause, the electric field telegraph should be employed to continue the line of communication, and *vice versa*. As such a relation of the two systems must often occur in actual service, it is the more imperative that the stations of the optical telegraph should be at such distances from each other that uninterrupted communication could be maintained day and night under all ordinary conditions of weather.

From an extensive report on exhaustive experiments made with signaling apparatus at the School of Army Signaling in British India in 1879 the following extract is made: "There does not appear to be any decided advantage in having one signaling apparatus for far greater range power than that of the other articles in the equipment, for, should the conditions necessary for the working of such apparatus fail suddenly, communication must cease, as the other articles of inferior range-power are not capable of being used at the same distance. It is satisfactory and important, of course, to have in the signaling equipment apparatuses that can be used for extreme ranges, as opportunities may arise when it would be invaluable to possess the power of communicating at those distances. But these occasions, under ordinary circumstances, would be so few that they should hardly be taken into consideration when estimating the relative values of the constituents of a signaling equipment, adapted to all reasonable requirements of army signaling in the field. It is plainly evident that if signaling-parties are equipped with flags, heliographs, and lanterns, that they would be able, except under peculiarly unfavorable circumstances of fog, rain, etc., to establish the necessary communication between stations, even ten or twelve miles apart, and to carry on signaling at all hours of the day and night. It is important to remember that the conditions which are most unfavorable to flag signaling are those which do not affect the heliograph, and *vice versa*. A bright, sunny day is necessary for the use of the heliograph; but such a day is generally unsuited for flag signaling, in consequence of solar haze. On the other hand, a dark, cloudy day is the best for flags, as the atmosphere is clearer on such occasions; but the absence of sun, of course, renders the heliograph useless."

It appears, therefore, that mirrors and flags must be considered complementary apparatus in signaling equipments, as, except under very unusual circumstances, conditions of weather must exist which

are favorable either to one or the other. If reliance be placed entirely on flags, or exclusively on the heliograph, it is not difficult to realize that serious interruptions will frequently occur in signaling operations.

In Algeria the optical telegraph supplants the electric telegraph for both commercial and military purposes, and short-range stations are the rule. Under such circumstances both certainty and celerity are attained.

The following extract is made from a report on visual signaling by Lieutenant J. C. C. Rambusch, Royal Danish Engineers: "He who wants to employ visual signals to the greatest advantage ought to pay attention to two things principally,—the distance at which signaling can be seen under ordinary conditions of the atmosphere, and the rate at which it can be carried on. The distance depends upon the transparency of the air, the skill and practice of the signalers, and the apparatus employed. Although the experience of signaling great distances might be very interesting, yet a perfectly serene atmosphere is so seldom, and commonly of so short duration, that such wide ranges as require similar weather can only be used in a few exceptional cases. Therefore distances approaching the maximum ought never to be employed unless circumstances make it absolutely necessary. This would only cause frequent interruptions and disappointments, and give credit to the charge of unworthiness so often laid against visual signals. If this charge is to lose all real cause, it is necessary to lay the foundation of signaling on such short distances that it may be carried on uninterruptedly, should even the atmosphere become somewhat hazy and quivering, or should there fall some rain."

What distance should be regarded as the minimum length of a signal line depends on several circumstances, such as the rate at which signaling may be carried on, the length and number of messages sent, and the number of mounted orderlies at disposal. In this case it is the actual distance to be passed over by the orderlies, not the line of vision, that is to be considered.

At the rate of two or three words per minute, for short statements of five or ten words, signal communication will be superior to orderlies at ranges of two or three miles, while orderlies may be preferable for messages of twenty-five or thirty words at distances of three or four miles. If no mounted orderlies were to be had, signal communication may be of great use at ranges of even one mile. What has been stated applies to a single message only, but if many messages are to be transmitted at short intervals, signaling will maintain a superiority over mounted orderlies at all ranges exceeding one-half mile.

While the most effective zone for visual signaling lies between one and twenty miles, it is relieved at longer ranges by the electric telegraph, and at shorter ranges by mounted orderlies. But as the proper employment of all three means of communication depends on many other

circumstances, there may be cases where the electric telegraph ought to be employed at shorter ranges which are otherwise suitable for visual signals, or that visual signals ought to be employed at ranges ordinarily better fitted for one of the other means of communication. In any case visual signaling is indeed indispensable if there is an impassable terrain of rather wide extent, a range of hills or mountains, the presence of hostile troops or of unfriendly inhabitants between the two points that are to be connected.

As a matter of course all visual signaling is rendered more or less impracticable by dense fog, heavy rains, violent winds, and thick snow. But the same weather that proves an obstacle to the optical telegraph also causes great difficulties to orderlies in making their way with promptness, and even the electric telegraph may be destroyed by storms or rendered useless by lightning.

During the campaign of 1886 for the suppression of Indian hostilities in the military department of Arizona, under the command of General Nelson A. Miles, operations in visual signaling were conducted with the heliograph only because of the extremely favorable atmospheric conditions of that region of country. The heliograph system of Arizona, under the charge of Lieutenant A. M. Fuller, Second Cavalry, consisted of fourteen stations with ranges of two and one-half, nine, twelve, thirteen, fourteen, fifteen, nineteen, twenty-one, twenty-eight, thirty, thirty-one, thirty-five, and forty miles. The entire line embraced about two hundred miles, and was in operation from May 1 to September 30, during which time the whole number of messages handled aggregated two thousand two hundred and seventy-six, amounting to eighty thousand and twelve words. The New Mexico division was in charge of Lieutenant E. E. Dravo, Sixth Cavalry, and consisted of thirteen stations, with ranges of eight and one-half, eleven, twelve, fifteen, sixteen and one-half, seventeen, seventeen and one-half, twenty, twenty-six, twenty-eight and one-half, thirty, thirty-one, thirty-six, thirty-eight, forty-four, and fifty-one miles. The entire system embraced three hundred and thirteen miles, and was in operation from May 9 to September 30. The number of messages handled during July and August reached a total of eighteen hundred and twenty-nine, amounting to thirty-five thousand seven hundred and twenty-seven words.

The quickest through work was performed over the Arizona division. A message of twenty-seven words passed through six stations, replied to by a message of twenty-five words, returned through the same stations, a distance of three hundred miles, in two hours and twenty minutes. In both divisions the distances between stations were about equally divided between long and short ranges. Ranges of thirty miles and over experienced interruptions from solar haze, dust-storms, and clouds.

During experiments in optical telegraphy made in August, 1885, near Aldershot, England, under the direction of Major Thrupp, inspector-general of the signal service, the distance between stations was eight, ten, twelve, and fourteen miles. Each post was provided with all the instruments necessary for the different modes of transmission,—viz., flags, heliographs, oil lanterns, oxyhydrogen lamps, telescopes, and marine glasses. The programme consisted principally in testing the operation of signaling over ranges of unequal length, such as are likely to be met with in the field. Messages of not exceeding thirty words each were transmitted each day from 9 A.M. to 12.30 P.M., 3 P.M. to 6 P.M., and 8.30 P.M. to 11 P.M. On the longest range, about fourteen miles, much difficulty was encountered owing to haze and smoke. At the other stations only accidental irregularities occurred during the day. The night signals were the most satisfactory in all respects.

The following extract is made from the annual report of the officer in charge of the United States Signal Service School of Instruction, Fort Whipple, Virginia, 1877: "Flags and torches can be depended upon in ordinary weather for distances of ten miles. This range should limit the distance between stations for regular work. Exceptional cases, where the stations are elevated, might warrant their establishment at greater distances. The increased range attained by the heliograph and shells does not justify the location of stations at such distances as might render both flags and torches useless. In clear weather when the sun is shining the heliograph and the flag can both be used, but when the haze becomes dense the flag becomes indistinct and difficult to read. At such times the heliograph is indispensable. In cloudy weather the heliograph cannot be used, but when the sun shines clearly the advantages of speed and certainty of communication lie with this instrument. It possesses more advantages of being easily screened from observation and of being read, if necessary, without the telescope. In the sunlight it would be far superior to the flag for moving stations. The flags, torches, and heliographs combined will, it is believed, insure almost absolute certainty of communication, and each should form a part of the equipment of every station."

This report was based upon exhaustive practical experiments in the field in the vicinity of Washington City, conducted by Lieutenant F. C. Grugan, Second Artillery, and Lieutenant T. H. Barber, First Artillery, under the direction of General A. J. Myer, chief signal officer of the army.

In August, 1887, Lieutenant Theodore Mosher, Twenty-second Infantry, was directed to open heliographic communication between Fort Lewis, Colorado, and the troops stationed at Blue Mountains, Utah. "After some preliminary practice the line was opened August 13, and from that date, to include the 17th, forty-eight messages, consisting of seven hundred and seventy-one words, were transmitted.

The distance between stations by the road is eighty-four miles; in a direct line not less than seventy miles, and probably nearer seventy-five miles. When the conditions were favorable the flash could be read with the naked eye, but the aid of the marine glass was generally found to be necessary. The station at Blue Mountains was on North Montezuma Creek, at a considerable elevation. The home station was on a spur of the La Plata Mountains, about fifteen miles from the post, with which communication was maintained by courier. There are difficulties in working over a distance of from seventy to seventy-five miles in a direct line. In the last few days I have seen it perfectly clear, conditions all favorable for work at one station, while at or very near the other rain was falling, making it entirely impossible to do any work at the latter. On another occasion the sun was good at each station, and while work was going on a sand-storm passed between the two, effectually closing business until it had passed. Smoke, haze, and fog or clouds are liable at any time to shut out one station or the other. A great difference was observed in the appearance of the flash on different days due to existing atmospheric conditions."

In August, 1887, heliographic operations were undertaken between Fort Assiniboine and Camp Sweet Grass Hills, Montana, in charge of Captain F. K. Ward, First Cavalry. The admirable report of Captain Ward presents very clearly the difficulties attendant upon long-range signaling. Extracts are made as follows: "The distance to the camp by wagon-road, I am informed, has been measured several times with the odometer and found to be seventy-two miles. The distance in an air line is not less than sixty-five miles and not more than seventy. The instrument used at first was the Grugan heliograph, having mirrors three and one-half inches square. Later, mirrors exposing a surface of one hundred and forty-four square inches were employed. I was at the camp during the appointed time for several days in succession. Some of these days were sunny and cloudless, but there was an intervening haze nearly all the time which shut out the Sweet Grass Hills from view entirely. The haze rose enough occasionally to let me get a faint view, though an unmistakable one, of the outlines of the Hills and mark their direction. They are a clump of hills, not a range, and they cover but a limited arc. The flash of the heliograph was turned in that direction and swept up and down and sideways through an arc much greater than enough for hours at a time, so as to thoroughly cover every point of the Hills. No answering flash was seen. By mail I learned that they had been up on the hills closely scanning this direction, but had seen nothing. To try what could be done from a less distance, I went on the 17th instant to Nymn's Coulée, on the road to the Hills, twenty-four miles from the camp and forty-five miles from the Hills. From that place the view of the mountains was quite distinct to me, and it was swept with the flash for two days. I have

since learned that they were up on the hills the second day watching from points which I saw easily from my station, but they saw no flash. On the evening of the 18th I returned to this post."

On August 20, Captain Ward had some better success with the large mirrors. As to the weather he states: "In some respects favorable, in others not so. It was favorable in that there was some rain, which partly washed out the haze and enabled me to see the post through the signal telescope, when the rain ceased. It was unfavorable in that I had no good sun during the three days I stayed there. The next day Lieutenant Greene used only the three-and-a-half-inch mirrors. The flash from them was seen very distinctly by myself and others with the telescope and field-glasses. It was so distinct that it could easily have been read. In fact, in the glass it appeared to me it ought to be visible to the naked eye, though it was not. The air was not free from haze, but the outlines of the hills back of the post were distinct, and some of the details of the hills and the buildings of the post could be discerned, though not very distinctly. On neither of these days did I have enough sun to give any answering flashes; therefore communication was not opened. I remained at Sweet Grass a third day in hopes of favorable conditions at both ends at the same time, but that day was cloudy at both places. Usually there is so much haze that, though the day be cloudless, the Sweet Grass Hills are not visible in outline even. From my experience of the past few days I am fully convinced that with one intermediate station communication between this post and the Sweet Grass Hills by means of the heliograph is possible and would be reliable for three days out of four during this time of the year, probably at times for weeks without interruption, provided that well-instructed men were available to handle the instruments." In forwarding this report, Major Henry Carroll, First Cavalry, commanding the post of Fort Assiniboine, made the following indorsement: "Respectfully forwarded. Communication with Sweet Grass Hills has been impossible with the instruments at hand owing to the lack of experience on the part of officers and men and the atmospheric conditions that have prevailed during ninety per cent. of the days since the camp was established (especially the latter cause). Under the circumstances mentioned by Captain Ward in this report, reliable communication might be feasible; under existing circumstances it is a complete failure."

In a further consideration of the difficulties to be encountered in long-range signaling, reference to the notable heliographic operations in New Mexico and Arizona during the first half of May, 1890, under the immediate command of Major William J. Volkmar, assistant adjutant-general and chief signal officer, Department of Arizona, should especially be made. The entire line extended from Fort Stanton, New Mexico, *via* Fort Cummings, Bowie Peak, Lookout Peak, and Baker's

Butte, to Whipple Barracks, Arizona. The distance actually operated over during the two weeks of practice was about two thousand miles. Number of stations, twenty-five, with one hundred and twenty-nine operators, under the charge of twenty-two officers and four non-commissioned officers. Number of messages handled, three thousand seven hundred and eighty-five, aggregating ninety-two thousand four hundred and six words. The ranges varied in distance as follows: five, twelve, fifteen, seventeen, twenty, twenty-three, twenty-eight, thirty, thirty-two, thirty-three, thirty-five, thirty-seven, forty, forty-five, forty-eight, fifty-one, fifty-three, fifty-five, fifty-eight, sixty-five, sixty-nine, eighty-five, eighty-seven, eighty-eight, eighty-nine, ninety-five, and one hundred and twenty-five miles.

The following extracts are made from the reports of officers in charge of divisions and stations:

Captain C. H. Murray, Fourth Cavalry, superintendent Arizona division, reported: "During the entire practice there was not an entirely clear day. Haze and dust generally so prevailed as to impede, if not debar, work. Three days of the practice were too cloudy for signaling. However, since a great number of messages were sent and received with dispatch, notwithstanding the unfavorable weather, it was clearly shown that only dense haze or dust totally prevented communication. Slight haze or dust did not seem to materially affect the visibility of the flash. The stations should be located on high mountains well covered with timber. Stations so located are above haze and dust, which are generally present at comparatively low altitudes."

Lieutenant Carl Reichmann, Twenty-fourth Infantry, in charge of Lookout Peak station: "On the whole, the weather was not as propitious as might have been expected at this season. Up to the 12th instant the atmosphere was clear enough for good signaling at ordinary ranges, but not for long-range practice, as up to that date we hardly ever could see the flash from Graham (distant ninety-five miles) without glasses. The 12th and 13th instants were the clearest days we had. The flash from Graham was plainly visible with the bare eye, and portions of messages could be read without glasses. The 14th instant was so hazy that we could hardly see twenty miles, and on the 15th clouds interfered seriously with the work. On the evening of the latter day the station was closed and abandoned. Communication with Baker's Butte (fifty-one miles) was easy; the adjustment of that station was always good, the sending precise, and the receiving prompt. There was no difficulty in communicating with Reno (thirty-one miles). There was considerable difficulty in communicating with Pinal (thirty-seven miles) on many occasions, especially between noon and 2 P.M. A good deal of this may be due to the position of the sun at this hour and the fact that Pinal was nearly south of us."

Lieutenant R. D. Read, Jr., Tenth Cavalry, in charge of Pinal station: "May 14, opened station 9 A.M. Entire country in every direction shrouded in dense haze, rendering it impossible to see beyond surrounding foot-hills. This was the condition of the atmosphere throughout the day, and therefore no work could be done at this station. May 15, opened station 8.45 A.M. Communicated with Graham (sixty-five miles) from 9 to 10.30 A.M., and with Lookout (thirty-seven miles) from 9 A.M. to 1.25 P.M., when passing clouds began to be very troublesome, causing work to be slow. Kept our flash on Graham from 1 to 2.15 P.M., desiring to transmit through messages received from Lookout. At 2.15 P.M. Graham responded faintly. We then endeavored to work with them, but the overhanging clouds prevented, as we could get nothing more than a few irregular and indistinct flashes from that station. We kept our flash adjusted on Graham until 4.30 P.M., when we prepared to close and abandon station."

Lieutenant A. L. Dade, Tenth Cavalry, in charge of Mount Graham station: "Although signals were successfully exchanged from Graham with Huachuca (eighty-five miles), I am nevertheless of the opinion that for successful, rapid, and accurate work signaling with the heliograph should be confined, as much as possible, to distances, for the service instrument, not to exceed forty miles, and with the large station instrument, not to exceed sixty-five miles. These distances are perhaps longer than would be advisable except under very favorable conditions of weather. Distances should not be so great that messages cannot be read by the eye unaided, most of the time. The use of the telescope or field-glass is exceedingly tiring and trying. When used for an hour or more, the vision becomes temporarily impaired, the eyes have a tendency to run water, and reading becomes difficult, if not very injurious. The wind, when high, also interferes seriously with holding glass steadily, and telescopes clamped by holders are no better."

Lieutenant J. A. Perry, Tenth Infantry, on duty on Mount Graham: "The long-range signaling was most interesting, and could be plainly read with a glass. While such signaling is possible under the favorable circumstances almost always attainable in Arizona, there are times when such distances could not be connected. It would therefore seem best to reduce the factor of uncertain communication to a minimum by having the distances between stations such that would give the greatest possibility of communication under all circumstances, even to signaling at night by flash-lights of some kind."

Lieutenant F. H. Albright, Ninth Infantry, in charge of Fourr's station: "In order to test the flash lantern I asked Lieutenant W. H. Hart, Fourth Cavalry, at Huachuca (thirty-seven miles) to adjust on us and try and send a message. This was attempted on three different nights, and while the attempts of the first night seemed to point to ultimate success, yet the test could not be carried out on account of

fog. With the aid of the telescope the lights of Huachuca could be separately observed, and for that reason I think that a message could be sent a distance of thirty miles with the flash lantern."

Lieutenant W. H. Hart, Fourth Cavalry, in charge of Huachuca station: "May 3, clouds prevented all but very little practice very early in the morning. Unfortunately, clouds prevented work on the 14th, and on the 15th Mount Graham (eighty-five miles) was enveloped in haze all day. Experiments were made with the flash lanterns by night, and it was found that the flash could be seen with the glasses, and naked eye as well, between this station and Cochise, distant thirty-five miles. With proper arrangements for holding the telescope securely, messages might be read at this distance."

Lieutenant H. W. Hovey, Twenty-fourth Infantry, superintendent New Mexico heliograph lines: "The difficulties which prevented San Andreas and Sierra Blanca (fifty-five miles) from communicating freely placed the Stanton division at the mercy of the weather, which was, almost without exception, unfavorable, and, therefore, but few through messages were passed beyond San Andreas. Finally, the station at Rincon (thirty-two miles) was ordered abandoned and the Stanton division also, conditionally. At the opening of practice it was hoped that communication might be had between Cummings and Bowie (one hundred and five miles) direct, and efforts were made from all apparently available points in the vicinity, including Cook's Peak. The haze, dust, and wind, however, made all attempts abortive in spite of the perseverance and patience manifested by all engaged in the efforts, which continued for twelve days. It is believed, however, that under favorable circumstances the flash may be successful. The weather during the practice was as unfavorable as could be, the atmosphere being filled with dust, and gales of wind, blowing daily, rendered operations slow and difficult. As the standard of line-work, however, must be established upon the basis of worst possible conditions, which certainly prevailed in this practice, it proved conclusively that heliograph communication may be conducted on long lines with almost certain success, and if a number of men at each post could be kept in practice continually the work on the line would be rapid and accurate to a degree beyond expectation. In practical line-work stations should not be more than thirty to forty miles apart, and it is believed that an instrument with mirrors of a size between those two now in use (four and one-half inches, and eight inches square) would at these distances insure steady work under unfavorable conditions, and permit of very long-distance flashing when the weather was favorable."

Lieutenant J. J. Pershing, Sixth Calvary, in charge of Fort Stanton station: "During the entire practice season the work was more or less interrupted by clouds, especially during the afternoon, the mornings being generally clear with one or two exceptions. On May

8 the station was not opened at all, as a severe sand-storm raged all day, and continued during the next day, though somewhat abated."

When we realize how fitful the atmosphere is, and, considering our own country, how large the percentage of cloudiness over the greater part of it, it is not difficult to realize what the advantages of the heliograph are, and the impracticability of long-range signaling.

Between the islands of Mauritius and Reunion, off the east coast of Madagascar, near twenty degrees south latitude, an optical telegraph (heliograph) was placed in operation for commercial purposes in May, 1883. The stations were distant from each other 133.56 miles. Their heights above sea-level three thousand seven hundred and eighty-three and two thousand five hundred and three feet respectively. Each station was furnished with a mirror having a reflecting surface of 10.76 square feet, or 1549.44 square inches. Here was an attempt to overcome the effect of solar haze by the use of an enormous reflecting surface, but, as reports show, with only partial success. When the weather was favorable the flashes were dazzling, "like a second sun." When dense haze prevailed, or clouds obscured the sun, work was suspended. After operations with the large mirror had been conducted for some time, further experiments were discontinued with the view of employing electric lights of sufficient power to insure uninterrupted communication both day and night. The cost of establishing one of these stations was fifty thousand francs. It was three months after setting up the large and costly apparatus before favorable weather would permit of communication over this great range.

The greatest range attained with the heliograph in Algeria has been about eighty miles; in Spain, from twenty-five to forty miles. During the geodetic survey of the British Isles a steady flash from the heliotrope was observed at distances of sixty to one hundred and eleven miles, when the atmosphere was favorable.

Captain Collette, of the British army in India, states: "Messages can, under the most favorable conditions of weather, be signaled with heliograph distances of fifty, eighty, or even one hundred miles without using telescopes. In the presence of some haze signals have been sent from Shaik to Bodeen, a distance of thirty-eight miles."

In 1873, Colonel Roberts, quartermaster-general in British India, reports that signals with the Mance heliograph can be read in ordinary weather without telescopes, up to fifty miles.

Mr. Samuel Goode, of London, states that flashes from 4½-inch mirrors are visible under favorable conditions of atmosphere in England twenty-five to thirty miles without the aid of telescopes. From 8- to 12-inch mirrors, when the atmosphere is very clear, fifty to eighty miles.

Colonel Begbie, instructor in army signaling in British India, reports as follows concerning the use of the heliograph: "As a mirror

with nine square inches of superfices was, under favorable conditions of atmosphere, easily read at a distance of twenty-six miles, while a glass of fifty square inches of surface was invisible at the slightly increased range of thirty-six miles, in consequence of the dense solar haze intervening, it appears impossible to tabulate the range-power of mirrors of various sizes."

Lieutenant-Colonel Wilkinson, Sixteenth Lancers, British army, reports, regarding the use of the heliograph: "Nature is constantly cutting off your line of communication. A passing cloud is quite enough to interrupt your most important message. There is no means at hand to restore communication, and at the critical moment of the battle your plans are disarranged by a cloud over the sun. This is an evil of such great magnitude that it at once places sun-signaling in the second class. Even in India the solar haze is so great and dense in the middle of the day that the flash is completely obscured at long distances unless sent from very high ground."

In France the heliographic apparatus designed by Colonel Mangin, of the Department of Telegraphs, has been successful over ranges of from thirty to seventy-two miles, during favorable weather. The diameter of the mirrors varied from thirteen and one-half to twenty-three and one-half inches, and the cost of the heliograph apparatus, complete for work, from three thousand to five thousand francs.

In the work of the United States Coast and Geodetic Survey, sun-flashing by heliographs is employed very extensively for locating points in long triangulations. The following ranges in California and Nevada have been operated over successfully: fifty-seven, fifty-eight, fifty-four, sixty, eighty-one, ninety-six, one hundred and thirty-one, one hundred and thirty-six, one hundred and thirty-eight, one hundred and forty-one, one hundred and sixty-nine, and one hundred and ninety-one miles. The following are the various sizes, in square inches of reflecting surface, of the mirrors employed: nine, fourteen, fifteen, eighteen, twenty-five, thirty-six, sixty-four, and one hundred and forty-four square inches. The elevation of the stations varied from two thousand one hundred and twelve feet to fourteen thousand four hundred and three feet above sea-level. In some instances more than three months were spent in waiting for an opportunity to get a flash.

Referring to the difficulties of long-range signaling, Mr. Charles O. Boutelle, assistant United States Coast Survey, writes as follows: "I occupied Bull Run Mountain, Fauquier County, Virginia, and was kept there more than twice the time usually required at primary stations by the persistent smoke or haze which always prevents satisfactory vision on long lines. This smoke remained during a range of the thermometer of fifty degrees and near two inches of barometic pressure, the wind blowing from every quarter, and was specially dense and persistent with a cloudless sky."

During the Egyptian campaign of 1882 the optical signal-stations were placed along the line operated by the electric telegraph, so that when the latter was interrupted by "breaks," "ground," or otherwise, which was quite frequent, the work could be taken up by the optical telegraph. The great plains and hot deserts of Egypt present insurmountable difficulties to the accomplishment of long-range signaling. Solar haze and refraction of light caused by the heated sand necessitated the establishment of short-range stations.

Major A. C. Hamilton, Royal Engineers, director of military telegraphs and signaling during the Zulu campaign, reports as follows: "We employed the heliograph to a very great extent when the weather conditions were favorable, having at times sixteen different signal-stations. The greatest distance between stations was thirty-five miles, the general range being from fifteen to twenty-five miles, and sometimes less. Short ranges were found to afford the best results."

It seems hardly necessary to proceed with further authenticated reports of the results of important experiments and field operations concerning the range for the most practical method of visual signaling. The subject, however, is of such a character that a merely theoretical discussion would prove entirely inadequate to meet the requirements of the problem presented in this paper. It is a question very largely of experiment, and the conditions should be sufficiently varied to fully develop the necessities of actual field operations, and of the emergencies which must be experienced in the preparations for war, as well as those to be met with on the field of battle. Extracts from reports of field-work have, therefore, been copiously made; but only from the most important experiments and from the most reliable sources, purposely selected from operations conducted in various parts of the world, presenting the most and least favorable climatic conditions for visual signaling.

The information thus furnished seems to present incontrovertible evidence in favor of short ranges, and the employment of apparatus which will provide the means of communication under all ordinary conditions of weather, day and night. Communication must be maintained without interruption whether the sun shines or not. If necessary, the optical telegraph must be successfully operated during a rain- or snow-storm, especially where it can exceed the efficiency of mounted messengers.

Lieutenant J. C. C. Rambusch, Royal Danish Engineers, states: "Signaling at the distance of four or five miles has often, without any serious difficulty, been carried on through an ordinary rain. Last autumn we signaled for two hours without interruption between Lyngley and Thinghöj, a little more than four miles, though it rained so hard we were all wet to the skin, and some had their top-boots full of water before we stopped.

"During the camp last summer, signaling with flags, lanterns, and semaphores was practiced twenty times, thirteen out of which were continued a part of the night, and a few times all night, until the following forenoon. Out of these twenty signalings, only one was completely interrupted for several hours by a dense fog. Another was partially interfered with for a quarter of an hour by the morning haze and smoke of some gunpowder. Four times there fell some rain during the practice without influencing it in any considerable degree. The distance between two neighboring stations was generally four to seven miles."

The atmosphere of the Scandinavian Peninsula and Denmark is one of the most difficult in which to conduct operations in visual signaling, owing to its great humidity; therefore these experiments are useful in illustrating the average range for the most unfavorable weather.

It has been impracticable within the limits of this paper to consider the construction of the various forms of signaling apparatus and what improvements are necessary to provide the most serviceable equipment for stations in the field. The matter has only received incidental attention, and likewise methods of practice and instruction with the view of developing a high degree of proficiency in expert knowledge of visual signaling, and in the use of the electric telegraph for military purposes.

Attention in this country has been directed to the heliograph to the exclusion of the development of other important apparatus, which should form with that instrument the equipment of every station. Sun-flashing is particularly attractive for various reasons, and the heliograph is admittedly the most powerful instrument that can be employed in visual signaling. But a cloud can render it entirely powerless, and thus, in an emergency, when the fate of an army might hang in the balance, communication for its safety would be impossible if the range between stations was beyond all other apparatus except the heliograph.

Again, heliographic signaling has developed day work to the neglect of night practice. The optical telegraph for night communication should not be omitted from field experimental work. Half of the time is lost if it is not taken up. If the range is wholly impracticable for communication during the day, the conditions may entirely change after sundown. Of course the range for night signals is less than that for day work, when the heliograph is considered, and practice with the latter has all been developed in one direction,—viz., the establishment of extreme distances for sun-flash signals.

The great desideratum is a combination equipment for the signal-station that will afford the means of communication under all ordinary conditions of weather, and also the determination of the maximum

range at which such communication can be maintained day and night. This is practically getting at the extreme range of the apparatus of lowest power in the equipment, which will fall between the flag and the lantern, with the exception that the modern signal-lantern will considerably exceed the range-power of the former, under the most favorable conditions of weather. The torch is truly an effective apparatus, but of less range-power than the flag. It can be depended upon in favorable weather for a distance of ten miles, is simple in construction, and is inexpensive. It may have a decided advantage over the lantern in the fact that a moving stream of light can be observed in a thick atmosphere when a steady or broken flash is completely lost, or too dim to convey intelligent signals. The torch should, therefore, form part of the equipment of every signal-station.

Realizing the importance and necessity of employing apparatus of different range-powers for the proper equipment of a signal-station, the writer brought to the attention of the army and militia in 1888 the result of several years of investigation and practical experiment, in the form of a combination equipment, called the helio-telegraph. There was joined in one complete and serviceable instrument that portion of the complete equipment, embracing mirrors, screens, telescopes, tripod, lanterns, and compass. The remaining portion, consisting of flags, joints of staff, and marine-glasses, necessarily separable for use, was conveniently packed with the former, for transportation, in three cases. Special attention was given to the mounting of the first-named portion upon a substantial tripod, similar to that employed for the surveyor's transit. Also to the construction of a sighting-rod with cross-hairs and micrometer-screw adjustment. A complete description of this apparatus will be found in the following publications by the writer: "Recent Improvements in the Art of Signaling for Military and Commercial Purposes." Illustrated. 200 pages. 1888. "A Manual of Instruction in Optical Telegraphy for the Use of the National Guard of the United States." Illustrated. 180 pages. 1889.

In view of what has now been presented, it would seem advisable that future practice in visual signaling should be directed to the accomplishment of uninterrupted communication both day and night, and the range made to conform to such necessities. After having found the range, which must vary with climatic conditions and elevations above sea-level, efforts should be directed to attaining proficiency in the mechanical operation of the apparatus, in sending and receiving messages, in becoming familiar with the construction of signal codes, in communication without a preconcerted code, in cryptographic signaling, and in the transmission of sketches and maps by signals. Such instruction and practice concerns the optical telegraph alone.

The electric telegraph for military purposes is not specially men-

tioned, for the reason that, as a part of military signaling, it falls without the limits of this paper. Of course all proficient signalists must be familiar with and operate both the optical and electric systems of signaling, although they provide for independent necessities, and, as such, extend the usefulness and scope of military signaling.

For military purposes, thorough familiarity with the apparatus and skill in its operation in the transmission of information of all kinds, day and night, is of far more importance than fitful work with only one instrument at impracticable distances.

Practice at short ranges does not in any way unfit an operator for long-range work; quite the contrary. But long-range practice actually narrows the experience and qualification of the operator by the enforced employment of one instrument, and thus prohibits familiarity with other equally important and necessary apparatus, and compels neglect of night work entirely. To transmit information by visual signals over a range of five miles in a rain-storm may exhibit more skill than to flash a message over one hundred miles in a perfect atmosphere.

It is not a question of occasional communication, under favorable conditions, over great distances, in certain sections of the country where the atmosphere is peculiarly propitious, but of maintaining continuous correspondence, day and night, at ranges which exceed the celerity of the mounted courier. These requirements make necessary the employment of a combination equipment, for day and night work, of flags, heliographs, lanterns, torches, telescopes on adjustable tripods, and marine-glasses, with a proper supply of extra parts and necessary tools for repairs.

Under these circumstances, the proficiency of the signalist will be determined not only by speed, accuracy, and number of messages handled, but by the skill and success with which uninterrupted communication can be maintained, day and night, and with which atmospheric obstacles can be overcome. It is the acquirement of such skill and readiness that makes the best preparation in peace for the exigencies of war.

JOHN P. FINLEY,
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A PITIFUL SURRENDER.

ONE warm November day, some five-and-twenty years ago, I was sitting in an easy-chair smoking my cigar late at night in one of the cottages at Key West Barracks. Our little command had just returned from our summer camp on Indian Key, an island of the Florida reef not over half a mile in circumference, where we spent seven long months to avoid the yellow fever, which was raging at Key West all summer. How weary we grew of our narrow confines, and how beautiful and wide the world seemed to me that day! But the excitement of landing and seeing the men safely housed in their barracks was over now, and I sat alone with my thoughts; the other officers and the ladies of the garrison had gone to an entertainment given at the hotel in the city by the naval officers of the ships that had just been released from their summer quarantine at Sand Key light.

It was the anniversary of my birthday, and I was turning over in my hands, thoughtfully and sadly, a letter which I had just received, then tossed it on the table with a sigh. In the succession of hard puffs at my cigar that followed, the words of the old song in the opera "Der Trompeter von Säkkingen" came to me:

> "Das ist das End vom Lied.
> Das end vom alten Liede,
> Mir fällt kein neues ein,
> Als schweigen und vergessen,
> Und wann vergäss ich dein?"

The house I was in was at the time the quarters of my friend Lieutenant Jack Villiers, who had asked me to share it with him till I had quarters assigned me. The cottages of the garrison are five in number, three on one side of the parade, two on the other, and those on the same side are separated by considerable distances, with large grounds about them, so that they stand quite alone. Each cottage is entirely surrounded by a wide piazza, and the stairs to the bedrooms run up from the piazza, outside the rooms on the first floor, to a little landing which opens into a narrow hall, on either side of which the bedrooms are situated. The drawing-room has several sliding doors with glass windows (windows and doors are one on the lower floor), and as I took

the last puff at my cigar I could hear the "Norther" that was coming up shake the doors and make them rattle as if to try them, and I could see the moonlight straying through and playing fitfully on the floor; the banyan-tree without, as it nestled close up to the eaves to get out of the cold, was sighing deeply, too.

Suddenly my eyes were held by a large photograph hanging before me on the wall, only dimly visible in the pale lamplight. It was one of those faces that fixes the attention at once and is never forgotten,—a dark complexion, nearly black hair, large, poetic eyes, with a soft look that is enhanced in effect by long lashes, a delicately chiseled outline, and a straight nose, but a mouth wherein the lines are weak and wavering. The eyes are the fascinating element, yet even in them there lurks an effect not quite agreeable, a something that attracts and yet repels,—one cannot help looking, and yet one longs for the freer air,—like the poor bird under the gaze of the serpent.

A gust of wind outside disturbed my thoughts and I rose and tried to shake off a feeling of gloom and sadness, but the dark eyes followed me about the room. I felt uncomfortable and touched the bell. Gus, our mulatto boy from the Bahamas, answered, and I asked him various questions about the pictures in the room, but avoided the photograph, hoping he would speak of that of his own accord, but his eyes never rested on it. Once, when I questioned him about a Venetian water-color hanging next to it, I thought I detected a little tremor in his voice and a frightened look on his face, but only for an instant. He talked freely about the other pictures, little incidents connected with them, some of his own experience (for he had been with Villiers a long time), some that Villiers himself had related, but he passed over the photograph as if it were not hanging there at all. I dismissed him to his home, a little shanty outside the reservation, where he lived with his aged mother, and I was once more alone with the weird eyes of the photograph.

I felt more and more uncomfortable, and, as it was growing late, I started for my bedroom, the dark eyes following my every movement as I went out through the door, cold shivers running through me as I mounted the stairs leading up from the piazza, startled occasionally by a moan and a sigh from the banyan-tree. I lay awake for some time, that face visible wherever the shadows fell, but, finally worn out, I was about to sink into sleep when a clock began to strike the midnight hour.

Hark! what is that? At the last stroke of the clock I heard something like footsteps on the piazza, then shoes creaking as if about to mount the stairs. I counted the steps; slowly and deliberately some one was coming up, pit, pat, pit, pat,—thirteen! The shoes creaked on the landing, and I half rose in bed and peered into the moonlight to see who had come at that late hour (for Villiers said he was going to

stay all night with one of the naval officers, so it could not be he). Nobody appeared.

I rose, slipped on a loose robe and a pair of slippers, and went out on the landing; the banyan-tree was still sighing and moaning, the moon yet bathed the landscape in a flood of pale, yellow light, the wind was trying the glass doors more and more impatiently, and the air had grown very chill. I crept down and walked round the entire piazza, but there was nothing living visible. I entered the dining-room, and there in the moonlight, that touched them with an unearthly light, there, gazing at me still, were the strange eyes as I had left them, but the lips seemed to smile, grim and ghastly. I touched the gilt frame that surrounded it, to make sure it was all a reality; then tremblingly sought my couch once more (counting the steps as I mounted them hoping there were more or less, yet knowing in my inmost soul that there were just thirteen, though I had never counted them before) to sleep a broken sleep.

The wind was blowing hard when I rose, and felt very cold to one accustomed for some time to continual Indian-summer weather; but in the sun, or in a place protected from the wind, it was still warm, so I dressed as usual in white summer clothing and a straw hat, but put on my overcoat as a protection against the cold north wind, and then walked down the road to the little cottage where Mrs. Mitchell, the wife of a sergeant who had died of yellow fever a few years previous, kept our small mess of three. There I found the doctor and Villiers already at breakfast, and the former, after greeting me, remarked that I looked pale. I merely smiled, but Villiers, taking a better look at me, cried out,—

"By Jove, old fellow, you must have been celebrating all by yourself last night; did you have a birthday, or" (more gently and in a low tone) "did she fail to lead the card you wanted, merely making what Mac used to call, when he led the lowest card of his weakest suit, *a tentative play?*"

"Both, Jack, both; but my paleness is not due to either of these causes," I replied, laughing, and perhaps blushing a little, too, for Jack knew all my secrets. "I had a strange experience last night," I added, more seriously, for the feeling which the face in the photograph and the footsteps on the stairs had inspired was not yet quite gone.

The doctor whistled and said, "Go on," as if he half knew what was coming. So I related my experiences in full. Jack became pale and thoughtful as I proceeded, with a pained expression on his face, which was occasionally relieved by a bright and happy smile playing at the corners of his mouth, followed always by a deep-drawn sigh, while the doctor gravely observed me as if he were studying a patient.

When I concluded, the doctor began, banteringly,—

"How many of Jack's so-called Havanas did you smoke?"

But Jack interrupted him: "Doctor, I am afraid this is a little beyond the realm of medicine; the photograph has its history, and, as to the strange sounds, they are supposed to be the ghost of dear old Floyd, whom Mrs. Mitchell, by her excellent nursing, pulled through the yellow fever one summer. Ah, Mrs. Mitchell, perhaps it had been better had you been a poorer nurse!" To which she nodded assent and turned away with tears in her eyes. "But now, let Will go up to the post, doctor, in your ambulance, which is standing at the door, and mount his guard (if it is not too late already), and after office-hours meet us at my quarters and I will tell you the story of the photograph."

I hurried off, but found the guard already mounted when I arrived; and so, chagrined and angry with myself, I reported to the commanding officer that I had missed my duty, but he assumed that there was some special reason for my neglect and smiled away my own displeasure. When I reached the house, after the morning's work was over, Villiers and the doctor were already comfortably settled in their chairs in the library, before the photograph. I glanced at it with an uncomfortable feeling of dread, and sat down with them. Villiers then proceeded with his tale:

"Before I went to the Point I attended the High School in Saint Louis, and among my companions was a young man, named Pierre Rossignol, a very pleasant playmate, always ready for any amusement, generous in a way, free with his money when he had any, and altogether a good fellow and a favorite with all. He was extremely handsome, dark, straight as an arrow, tall and well-proportioned, with fine-cut features and soft eyes with long eyelashes (giving him a gentle and sympathetic expression), and a great beau among the fair sex. Some days he would have his pockets full of small change, at other times he seemed really hungry as he munched the buns given him at luncheon: I remember it struck me as strange at the time.

"But, for all his good qualities and his popularity, it was evident to the most casual observer that he usually had what he wanted, that some one was continually doing something or other for him, and that he was petted and spoiled; he received these attentions as if they were his due; indeed, there was always, about everything he did, an element of selfishness. But, as he was good-natured and apparently anxious to please, most of the boys in their generosity forgave him, if, indeed, they ever observed this characteristic of his at all.

"He was very visionary in his ideas about his future, and spoke as if he expected some day to have a great fortune; and this impression among us, regarding his prospects, was strengthened by the fact that in speaking one day about the dancing-school he attended, he let fall some remarks which indicated that he was already quite familiar with the gaming-table (he evidently spent his evenings after dancing-school

there), which to us seemed a great thing at that time and only possible for very rich people.

"Altogether he was an interesting character. The first impression he produced was always good, yet he never seemed to care to take advantage of his powers of fascination, but rather gave an impression of indifference. After I left home I often wondered how the world would go with him, until one day, about two years ago, what was my astonishment, when, while I was sitting here in my chair thinking about him, he suddenly appeared in the door-way there!

"We greeted each other cordially, and then I noticed a female figure behind him, and he turned and introduced his wife; he added that he was on his wedding-tour, and was going over to Havana, and then to New York. The steamer, he said, would lie at the wharf in Key West till early in the morning.

"Floyd was here with me and took the greatest fancy to my former school-mate and at once engaged him in conversation, while I chatted with Mrs. Rossignol. She was a charming character, very young, almost a child, with light golden hair and clear blue eyes,—so clear that it was a pleasure to look into them,—with a frank and confiding way about her that won my poor heart at once."

> "'Just a mere child with sudden ebullitions,
> Flashes of fun, and little bursts of song,
> Petulant pains, and fleeting pale contritions,
> Mute little words of misery and wrong;
> Only a child of Nature's rarest making,
> Wistful and sweet,—and with a heart for breaking!'"

quoted the doctor. "Does that paint the picture?"

"Yes, that applies very well," continued Villiers; "but she seemed to have withal a sort of dread of her husband that was noticeable whenever he addressed her, or whenever I asked any questions relating to him, which naturally roused my sympathy. However, she seemed to be fond of him too, and he was very kind to her.

"Towards evening we sauntered down the beach, Floyd and Rossignol going on ahead, Floyd telling me in a low tone as he passed that I would find them at Captain Jack's; I walked with Mrs. Rossignol, and I shall never forget that walk. It was a beautiful day, and the pure white coral sand was packed hard and firm where the tide had gone out, the setting sun throwing a rosy veil over sky and water and beach. We sauntered along slowly, picking up a bright-colored shell now and then, or watching a hermit crab secrete himself in his stolen home, or a fiddler crab dancing his sidewise jig. I took her to the edge of the water and showed her, just covered by the water at low tide, a sea anemone clinging to the rock, with all its beautiful, delicately-colored tendrils displayed. She took the greatest delight in

all these little things, and to me they acquired an interest such as they had never possessed before, and which they have preserved ever since.

"Finally, we stood on the wharf at the steamer-landing, and she looked up with a start. Then she held out her hand very simply and naturally. 'Thank you,' she said; 'it seems hard to believe that you are all real here, and that this is not a fairy island in this beautiful pale-green sea. I have been so happy!' Doctor, you may smile, but I confess, when the coldness, the selfishness, the uncharitable spirit of this world has at times embittered my heart, I have remembered her and felt that it is still beautiful and good.

"I did not go to Captain Jack's: I was not in the mood. I went slowly back as we had come. When I retired for the night, Floyd had not yet come home. I lay awake thinking over the strange events of the day, and did not fall asleep till towards morning. I was awakened by a sharp report near by, and jumped up and hurried across to Floyd's room (the one overhead, where you slept last night, Will), and found Floyd on the floor in the corner, a smoking revolver in his hand. He did not speak again. Next day I learned that he had lost heavily to Rossignol; and in the evening came this photograph of my former school-mate. The tale is told.

"Yesterday was the anniversary of that eventful day, and a year ago I experienced just such a night as you did last night; that is the reason I remained down-town yesterday. I did not suppose that it would affect you."

Nearly two years had passed since those November days at Key West, and I was enjoying a tramp in the Black Forest during my summer leave of absence. I had left Villiers at Baden-Baden because he preferred to be in the crowd at the Conversations Haus. One day, as I returned, tired and dusty, from a two-days' walk over the Kniebis, the Triberg, and the Kandel, to Freiberg, which I used as a centre from which to radiate on my various excursions, I concluded, instead of going to my rooms, to get a mug of beer and some supper in the little garden of the Alte Burse, a restaurant much frequented by the German officers, partly because the beer was good, and partly because it was served by a very pretty bar-maid,—*die liebe Marie*, as we called her when she was good enough to come to our table and chat with us a while.

I sat down at a table in the far corner of the garden with a young artillery officer and a student of the university, both of whom I had known for some time. We talked gayly for a while, but when my supper came the others bade me good-night. The garden had filled up gradually since my arrival, and almost every seat was taken except those at my table. I had just finished eating, when a man dressed in rather a shabby suit of clothes sat down at my table and called for a glass of beer in German that had a decided English accent. I did not

notice him much at first, but after a time it struck me that there was something familiar about his face, and I could not help glancing at him occasionally. What was it that made me feel so uncomfortable as I looked at him? My interest grew deeper, and finally, as his eyes met mine, I could scarcely suppress an exclamation, for surely I had seen those eyes before, and under circumstances not altogether pleasant,—soft, dark eyes they were, and I became nervous under their gaze. But I could not recall the man.

Marie came up and asked me how I enjoyed my supper, and after a few pleasant words and a "dynamic glance" or two, such as only a bar-maid who has been to Kissengen and Carlsbad can give, and which is even then vouchsafed only to those who give Trink-geld in American fashion, she started away to refill my beer-mug. It may have been my imperfect German, or my English clothes, or my apparent good nature, or perhaps the combination of all these, that induced my neighbor to open the conversation; at any rate, he did so, remarking in English,—

"This out-door life of the Germans and the simplicity of their enjoyments have a great attraction for me. Do you not find it an agreeable change from our hurried existence at home?"

"Yes," I replied; "it must be particularly so to a business man, or any one confined all day to his office. I met such a one the other day who was so delighted to be over here out of the reach of telegrams!"

"I find it so," he said; "my brewery keeps me very much occupied, because it has grown enormously of late."

Under the long, dark lashes I could see that his eyes wandered a little as he made this remark, and did not look at me. We conversed for some time, and he grew more and more enthusiastic about the brewery. Suddenly he asked me:

"What is your business? Or are you merely traveling for pleasure?"

"I am in the army, and am taking a little vacation."

"Ah! Have you ever met my friend,—my school-mate,—Lieutenant Villiers?"

My heart stopped beating for a moment. I could hear the banyan-tree moaning and the north wind shaking the glass doors. It was he of the photograph, and its strange, fascinating eyes were gazing into mine in real life!

It was some time before I could collect my thoughts. My neighbor grew more confidential when I told him that Villiers was an intimate friend of mine, and finally confided to me that he was there to purchase the secret for making the very beer we were drinking. The arrangements, he told me, were almost completed, but he found himself short of money, and could not at once pay certain little fees and

incidental expenses connected therewith, and yet he did not like to leave without completing the purchase. He added that if I could let him have fifty marks temporarily he would settle the matter that evening. I gave him the money, and he took down my address. After a little general conversation he departed.

Next day I went back to Baden-Baden and found Villiers at the Victoria. I did not tell him of the meeting at Freiburg. In the afternoon we took a stroll out through the Lichtenthaler Allee, and returned past the Conversations Haus on our way towards the Promenaden Platz, when, as we passed the Trink Halle, opposite the Hotel de l'Europe, I saw on the corner balcony of the first étage of the hotel what looked like the figure of Rossignol, dressed just as he was when I met him. Villiers was in a brown study, staring straight ahead, so he observed nothing; and as I had thrown aside my tramping-costume and had donned my morning suit, there was no danger of my being recognized, so I looked hard at the balcony and the figure there. Yes, it was certainly he. While I was wondering if he could be there all alone, a female figure appeared behind him, a baby in her arms, and my question was answered. We walked on, Villiers and I, and I could not help thinking how strange it was that she, whom Villiers was probably at that moment thinking of, but supposed far away over the sea, whom he had known but a short afternoon on a certain coral-beach in a far-off land, she of the light golden hair and deep blue eyes,—

> "Whose voice, attuned above
> All modulation of the deep-bowered dove,
> Is like a hand laid softly on the soul,"

should stand there on the balcony, with her one-year-old baby, thinking, perhaps, of that same coral-beach!

We walked home almost in silence. In the evening I called on Mrs. Rossignol, sending word with my card that I was a friend of Lieutenant Villiers. She received me at once, and, after informing me that her husband had gone out for the evening, inquired how my friend was, and what was he doing, and was he happy? She spoke of her visit to Key West with girlish glee; it was evidently a pleasant memory, that was all. But *was* it all? Why, then, that little sigh, and why are the beautiful blue eyes dim for a moment; but, above all, why that sad look in the eyes of one so young? I learned (what I particularly wanted to know) that they had only recently come (from Homburg von der Höhe, I think it was), and were going to remain for some time. I determined to take Villiers to Paris in the morning, and, after a brief stay there, to start with him for home.

On my way to my rooms I concluded that I would first look into the gaming-rooms, and so turned my steps in that direction. As I sauntered through the long rooms, glancing along the line of faces in-

tent upon the turn of a card, or the whirl of a wheel, I recognized, at one of the tables, a dark face, watching eagerly the little pile of gold pieces in front of him, and, as he raked in his winnings with his thin fingers convulsively, I saw him pass half of them to his neighbor, a lady, deeply veiled.

I passed out into the street again. A light was still burning in the corner room of the Hotel de l'Europe, and my heart went out to her who sat there waiting, to her whose thoughts are centred in the little cradle there in the corner,—

"Whose endless hopes revolve about
A planet, *ætat* one."

On a cold and rainy day I arrived from Lucerne over the Brünig at Interlaken; my heaviest overcoat could not keep me warm; I walked restlessly up and down the Hoehen-weg in front of the hotel; my own rooms were cold, the smoking-room was cold, the reading-room was dreary, everybody looked depressed. I paid my bill, intending to go to Berne on the evening train,—anywhere where it was warmer,—when the clerk said,—

"Stay another day; there was a fresh fall of snow on the mountains to-day, and it will be clear to-morrow."

"Very well," I said; "I'll keep my rooms."

Next morning when I awoke the sunlight was streaming through the window; I dressed hurriedly and walked out on the piazza. There, between two dark precipices of the nearer mountains, stood the Jungfrau, a mass of the purest, whitest snow, glistening in the sun. Can anything be more lovely and beautiful!

I heard an exclamation of glad surprise behind me, and, turning, found myself face to face with Mrs. Rossignol. She was evidently pleased to see me, and I confess it was a great pleasure to me to look into her serene blue eyes again, to see that gentle face so bright in its loveliness, to hear her low sweet voice as she inquired about my own doings first, and then about Villiers. They had never met since that November afternoon on the beach at Key West, yet she seemed to remember him as if it had been but yesterday. I was very glad he had decided to remain in Baden-Baden.

We had a long talk, we two, in the sunlight, there before Nature's great masterpiece of scenery, and she talked freely about herself and her boy, but she did not once mention her husband's name. Finally, I asked her how long she was going to stay in Switzerland.

"Oh, why I am going to Paris to-morrow, and then to Havre," and a little shadow passed over her face, "to meet my husband, who is coming back on the French steamer with my little boy," and then the shadow passed away; "he has been on a short visit to his grandmother."

Pretty and young as she was, there was a something in the expression of her face that spoke of deep, deep thoughts;—ah, yes, life was not all she had pictured it in her girlhood days. But how brave she was! Not one word of complaint or regret; always bright and cheerful. Even as I stood there, thinking of all this, she turned with a cry of delight, caught up a rosy-cheeked boy and tossed him up and caught him again, then ran away for him to catch her:

> "I know the children run,
> Seeing her come, for naught that I discover,
> Save that she brings the summer and the sun."

That night, as I lay in bed thinking of Rossignol, it suddenly occurred to me that I could not let Mrs. Rossignol travel alone with her maid all the way to Havre, and that I might as well go on the same train and look after her welfare a little without appearing to do so, especially as I knew full well that this trifling act of kindness would greatly please Villiers if he ever heard of it.

She did not seem surprised to find me on the boat, and we had a charming morning for our journey over the lake of Thun, and then the train hurried us along on our way to Paris. There I learned that the French steamer was not due for another day, so I persuaded Mrs. Rossignol to stop over for a few hours at Rouen, where I could show her all the places of interest, as I had once spent three weeks there, in my rambles, with a young architect from Philadelphia; and then she could go on with her maid, while I would look up my old friends and make my way leisurely to Baden-Baden.

On our arrival at Rouen we started at once for St. Ouen, but in the square around the cathedral we came upon a crowd of people, through which it was difficult to find our way. Our main object at first was to get by as soon as possible, but presently we heard some one near by whisper breathlessly to his neighbor something about a wreck. We both looked up, and just before us was a sailor telling a thrilling tale to an excited little group of listeners about him. We instinctively stopped to listen.

"There had been a dense fog for twenty-four hours," he continued, "and we knew we were near the entrance to the channel, somewhere in the vicinity of the Scilly Islands, when suddenly, just about daybreak, there was a terrific crash, and a rumbling like that of thunder, and we sailors knew that she was on the rocks. The life-boats were manned at once, but the passengers were wild with excitement, and men and women jumped into the water, or rushed wailing and crying up and down the decks, or crowded into the boats, all in the greatest confusion. Soon the sea was alive with human beings struggling to keep afloat by swimming or by clinging to pieces of timber floating about."

"What became of Pourquié?" some one asked; "is he saved?"

"Ah, poor Pourquié!" said the sailor; "we have made many voyages together, but that was the last; yet Rouen should be proud of her townsman Pourquié, for he was a noble fellow. There was among the passengers a little boy with blue eyes and dark hair; his father spent much of his time in the smoking-room, so the little fellow was always on deck, and he was such a beautiful child, so frank and manly, with such winning ways and entirely without fear, that the sailors all loved him, and on fair days, when the captain would let them, they would carry him up into the rigging, and we all became deeply attached to the little fellow. When the ship went down and our little boat had all it could hold, and we were about to make for the land, we saw Pourquié in the water, clinging to a spar with one arm and holding up the little boy with the other, and I heard him call to me to take him, but he sank before we could reach him, and little Pierre with him!"

"Pierre!" I hear a wild cry at my side, and Mrs. Rossignol lay in a swoon.

We are again at Baden-Baden, Villiers and I, enjoying the beautiful days and the crowds of people and the music. I told him the story of the wreck, and how we had heard it; but I did not tell him that I had brought Mrs. Rossignol to Baden-Baden, and installed her in her old rooms in the Hotel de l'Europe, opposite the Trink Halle. Only a few of the passengers on the French steamer had been saved out of the wreck, and they had disappeared to their several homes; and although Rossignol and little Pierre were reported among the lost, Mrs. Rossignol believed her husband still alive.

It was a long time before she recovered from the shock of that day in Rouen, and during that long period I was almost her only visitor. She kept her rooms, and lived very quietly, but after a time she began to long for the free air again, and then we used to walk up to the old castle of an afternoon, at first only occasionally, but soon quite regularly, almost daily, until Villiers (who preferred walking on a level to any climbing) began to wonder how any one could become so fond of that old castle.

"Why do you climb that hill almost every afternoon, Will? Ah, I see! there is some Lorelei on the rocks up there."

"Come up and see her, Jack, for she is very beautiful. You drive up to the castle to-morrow, about three, and wait for me there, and if your little boat isn't a wreck on the rocks before the day is over, while you are absorbed in watching the Lorelei 'combing her golden hair,' why, I'll give you a dinner at the Café Madrid, out in the Bois, when we go to Paris."

So it was arranged, and so they met. Villiers did not know that

he really loved this little woman with the light-golden hair until they met again: it seemed before as if he might have loved her had he met her long before that walk on the beach, so that her memory was only a tender regret, but when he saw her face to face he knew. And she? Ah, well! she was still waiting for Rossignol to come back. But the days passed by, and no news of Rossignol came. Villiers was very gentle and delicate in his quiet devotion. At first he met us just a little way below the castle and walked up with us; then he would meet us half-way up; and finally, just outside the hotel (he would never go alone to take her for a walk). Both believed for a time that their interest in one another was the purest friendship,—nothing more. But Villiers was the first to be undeceived (by my assistance, of course). How fond he had suddenly grown of climbing hills! So the days, and weeks, and months passed by.

But now I could see that Mrs. Rossignol was making herself very unhappy, and then I had a long talk with Jack one day, and convinced him that he had to go away, for the simple reason that, as Mrs. Rossignol believed her husband to be still alive, there was nothing else for him to do; and so I brought him home. It was very hard, after all the bold strategy with which I had opened the campaign, and the fine tactics which Villiers had displayed on the field of battle, to be thus forced to beat a hasty and ignominious retreat.

The following year, one quiet, peaceful, sunshiny October day, Jack and I were sitting in front of our quarters at Fort Point (near San Francisco), the little house down by the water's edge, there where the waves, turned obliquely by the wall of the fort as the tide rolls in through the Golden Gate, curl high into the air.

"You say she is visiting at the general's in the Presidio?"

"Yes; the General's wife used to know her at home before she was married."

"Jack, do me a favor and call there this afternoon at three o'clock. I will drop in a little later and walk home with you. I want you to do this for a particular reason."

"What is the use, Will?" said Jack, wearily; "but all right, I'll go."

At about a quarter after three I was ushered into the general's drawing-room, and found Mrs. Rossignol and Jack talking in a painfully formal way. They were quite alone in the room. After a few general remarks I drew my chair between them and said,—

"I have had a strange experience."

"What was it, a ghost?" said she.

"No, but something more wonderful. You know when I came to join the regiment out here I had authority to come by way of the isthmus. Well, one day when the sea was rather rough, the captain of the ship and I began talking about experiences in storms and ship-

wrecks, and he presently remarked, 'I had one once that I never want repeated! It was on the Scilly Islands, when I was second officer on one of the French steamers: you may remember reading about it.' He gave a vivid description of it all, and then I asked him if he remembered a man named Rossignol among the passengers."

"'Yes, very well,' he said; 'he was in the card-room all day long and most of the night, and the betting, as you know, often runs very high, but he was very bold at any game and seemed to care for nothing else; but when the crash came he was one of the first to rush for the boats. The boat he was in was crushed in the excitement, and as my boat was passing along, picking up the men and women in the water as fast as we could, I saw him ahead, clinging to a spar, a sailor at the other end of it. Near by another sailor was holding up his little boy, Pierre, and crying for help. Rossignol did not stir, but the sailor at the other end of the spar jumped and caught the boy as he sank, then swam for the spar again, but Rossignol was no longer on it; his hold had slipped and he went down, and did not rise again. Before we could reach the boy, his brave protector sank away exhausted, calling to one of the men in my boat with his latest breath not to mind him but to take the boy, but we were too late.'"

There were some moments of silence, and then the widow rose and gave both her hands to Jack without a word, tears filling her eyes, and —I retired. The campaign was ended, the enemy had run up the white flag, but was it not *a pitiful surrender?*

Years have flown by since then, and even as I sit here, in my old bachelor rooms, Jack and his wife go by the window smiling into each other's faces; and there she turns to send a little smile in my direction, for she knows I am sitting here, and I inwardly bless the sunny hair and the beautiful blue eyes.

"Oh, what tears have they shed, gentle eyes! Oh, what faith has it kept, tender heart! If love lives through life, and survives through all sorrow, and remains steadfast with us through all changes, and in all darkness of spirit burns brightly, and exists with the very last gasp and throb of the faithful bosom, whence it passes with the pure soul, beyond death, surely it shall be immortal!"

AMONG OUR CONTEMPORARIES.

THE report on the "United States Naval Ration," by Surgeon C. A. Seigfried, U.S.N., in the last annual report of the Bureau of Medicine and Surgery, is certainly the most able one upon that subject which has yet appeared. Its preparation was requested of Surgeon-General J. Mills Browne by the section on physiology and dietetics of the American Medical Association.

Dr. Seigfried, after a glance at the moral and social results which of late years have been obtained from a more scientific training and feeding of great armed bodies, remarks: "It is said with justice that since universal military or naval service has come into effect in European countries many problems relating to sectional antipathies, as well as the causes of disease and the spread thereof, influencing whole provinces, are being removed. This is notably so in Italy, and is a powerful factor in the regeneration and unification of that country. So from the stand-point of hygiene and as medical men it cannot be an evil that these hosts of human beings are so collected together, groomed, trained, and fed as science dictates; for once implanted in them by the power of the state, these habits and impressions must to a great extent remain with them on their return to their former pursuits and civil occupations, and in so much do they and the community to which they belong benefit. It is not too much to say that this universal service is in Europe a great uplifting agency, and on the other hand wars are happily not more frequent than under previous conditions."

Dr. Seigfried says, "Scurvy among seamen, and even on land, up to the end of the last century, has been a classic theme in the study of causes and sequelæ of improper and insufficient dieting, and the present appreciation of the disease may not inappropriately be referred to here.

"It has absorbed the attention of naval medical men because of the magnitude of the losses of life, exceeding in the past that from all other causes combined.

"It was not uncommon for a naval vessel in three years of remote foreign service to lose a sixth or even more of her crew, and in the voyages of discovery a century and a half ago often but a handful returned of the hundreds who originally ventured, and these, misshapen,

brutalized specimens of humanity. To the immortal credit of Captain Cook he was the first to furnish the experimental proof on a large scale of the value of succulent fruits and vegetables and their acid juices in preventing and curing scurvy. This occurred in 1772–75, during his second voyage, when with a crew of one hundred and eighteen men he circumnavigated the globe, and brought all but four home with him, three dying from accident and one from consumption. This memorable event, and successful dieting, for which he received the medal of the Royal Society, took place only thirty years after Anson's voyage of discovery, in which out of nine hundred men he lost six hundred from scurvy in three years. Yet, like all reforms in hygiene, the lessons of Cook's experience and the pleadings of naval surgeons had but little effect, and scurvy figured heavily in naval mortality tables up to fifty years ago. Cook's vessels in 1772 were supplied with malt, saurkrout, salted cabbage, 'portable broths' and soups, mustard, marmalade of carrots, inspissated juice of wort and beer, and as much as possible of live-stock. He knew the value of fresh berries, he cooked grasses and greens with the dry legumes and cereals, he used the fresh flesh of all animals and birds, and he even distilled sea-water in times of scarcity. To produce dryness and to fumigate between his narrow decks he used the fire and smoke from portable iron baskets. By these various means he successfully traversed (in his ship, the 'Resolution,' of less than four hundred tons burden) the seas from the latitude of England to south latitude 70°, in the tropics and antarctic ice regions alternately, and encircled the globe."

As Dr. Seigfried remarks, there was nothing absolutely new in this; only the intelligent application of known facts, for "the value of lime juice was known from 1573 (Solomon Albertus), 1593 (Sir Richard Hawkins); and in 1795, through the importunity of Blane, it was regularly issued in the English navy. It is not in the regular United States naval ration. In the English Arctic experience in 1875–76 it was found that scurvy occurred when lime-juice was omitted, even though pemmican and preserved potatoes were used. From Kane's time raw meat is of known value. It is to the absence of the substances of the fourth group of aliments that scurvy is due, and these include those salts and bodies in tissue solutions to which much of the catalytic and dialytic properties of organic fluids, and exchanges in normal nutrition or metabolism, are due."

Of our own service he says, "In 1861 the law provided preserved meats and desiccated vegetables for the first time, and the spirit allowance was abolished shortly afterwards. More latitude was given for substitution and variety. The canned and desiccated food-stuffs met with little favor from the men, and the suppression of Jack's grog was considered nothing short of a crime, and caused much discontent at the time. The total lack of spirits, beer, or wine in a sea dietary is not in

accord with the opinion of many hygienists and sea-going people, and the law has not improved the content with many inexorable deprivations of sea-life. This ration was satisfactorily used during the Civil War. In 1872 an additional ounce of coffee and sugar was allowed for an early breakfast. Sailors, so long as they have money, constantly and freely add to their daily fare from market or 'bumboats' which come alongside at meal-times in all parts of the world. Fruits, bread, and eggs in great quantity are consumed in this way, and great bag nets filled with potatoes are carried to sea in addition to their allowance. It has occurred to me that salt meats rarely in practice come up to their theoretical values, and this, with some deficiency in fats,—usually due to waste in cooking,—has caused the sometimes prodigious egg consumption from bumboats. All seamen desire large rations, and naturally prefer fresh food. They are also great growlers, and naturally look with suspicion upon innovations in their rations, and the best intentions are in this regard often thwarted by them.

"In 1884 the honorable Secretary of the Navy appointed a board of officers to revise and advise concerning the ration, and the present regulations date from that time. The list of articles was amplified, and in many respects the food, meal hours, and methods of preservation, packing, and issue were improved, so that on the whole, while not substantially increased in quantity over that provided by the law of 1861, the ration is superior to that of other naval services, and compares well with standard and model dietaries. But the nutritive and dynamic values are, according to my calculations, inferior to that of some classes of laboring men and mechanics in this country; and it is lacking in a just proportion of elements, the fats being deficient in the common sea issues and the albuminates in the fresh issues."

In regard to a spirit ration, it seems that some provision should be made for supplying spirits, when the necessity occurs, other than from the limited supply of stimulants in the hands of the medical officer,—the only source which the law at present recognizes on board of naval vessels.

On one occasion, not very long after the abolition of the spirit ration, the writer expended in one twenty-four hours of fearful storm all the allowance of the medical department of a sloop of war for one year,—barely keeping the firemen at work in that way. In the mean time the ship lost two boats and other gear, and we had one man killed outright, and another died from exposure, among the people on deck. A ration of whisky would have been a boon to those on the spar-deck, but the safety of all hands lay in keeping the engines going, and so steam had to be kept up in both ways. There ought to be a moderate amount of spirits carried in men-of-war to be issued in emergencies, by order of the commanding officer, on the recommendation of the surgeon. Every time the issue is made it might be stated in the log-book,

with the reasons therefor. In the days of the grog-ration the "splicing the main-brace" was seldom done without cause, according to our recollection. During or after severe labor of an unusual kind a "tot" of whisky was thoroughly useful, and often given at a season when hot coffee was not to be thought of.

Although General Rufus Ingalls's death is not a very recent event in these times of bustle and hurry, when people forget so rapidly, we cannot refrain from some remarks upon an officer who was only second to the "great quartermaster" Montgomery Meigs, and who was, probably, as well known personally by army and navy officers as any other who served during the war of the Rebellion.

General Ingalls graduated from West Point in 1843, and entered the mounted rifle regiment, formerly the Second Dragoons, and now the Second Cavalry, a corps with a record. His service was constant, mostly upon the frontier and in California. During the conflicts at Embudo and Pueblo-de-Taos, he was present, and, when Captain Burgwin fell, on February 4, 1847, he was by his side, assuming command of the "regulars," and was afterwards brevetted for "gallant and good conduct" on the occasion.

In 1848 he was made captain in the quartermaster's department, and took to California, *via* Cape Horn, the first detachment of recruits sent to that coast, where he served a number of years. He was with Colonel Steptoe's expedition across the continent, and was on the staff of General Harney, at Fort Vancouver, during the San Juan affair. Before the attack upon Fort Sumter he sailed with the command of Colonel Brown, as chief quartermaster, to re-enforce Fort Pickens, and, after some months, was ordered back to McClellan's army. When the move to the Peninsula was made, Colonel Ingalls had sole charge of the transportation and supplies of this very large army. He remained on duty as chief quartermaster of the Army of the Potomac until the end of the war, one of the most important posts it is possible for a soldier to fill.

As brigadier-general of volunteers and quartermaster-general he was present at South Mountain, at Antietam, Fredericksburg, Chancellorsville, Gettysburg, and many other engagements, up to the time of Lee's surrender.

General Ingalls's long experience as a regimental and assistant quartermaster made him an invaluable chief quartermaster for the Army of the Potomac. His promptitude in meeting the many trying exigencies that he was called upon to face was remarkable, and few men whose duty it was to clothe, feed, and transport thousands of men at all seasons and under varying and exacting conditions ever began and completed their work with such dispatch and thoroughness as did

General Ingalls. He was an ideal quartermaster, and a good quartermaster, whether of a regiment or an army, is a most important factor in time of war. General Ingalls's abilities were highly appreciated by General Grant, and the friendship of the two officers was close and lasting. Millions of dollars were expended by him during and after the war, and he had throughout his career the respect and esteem of his comrades and his country.

The brevet of brigadier-general in the regular army was conferred upon him in 1864, and on March 13, 1865, he received the rank of major-general for meritorious services. In 1866 he was mustered out of the volunteer service, and was stationed in New York City, from April, 1867, until July 31, 1876, as chief quartermaster of the Military Division of the Atlantic. When Quartermaster-General Meigs was retired, in February, 1882, General Grant and other admirers of General Ingalls urged his promotion to the vacancy, but the place was given to Colonel D. H. Rucker, the father-in-law of General Sheridan. General Rucker held the place only seventeen days, when he, too, was retired, and on February 23, 1882, General Ingalls was given the coveted position.

General Grant, in one of his conversations with John Russell Young, alluded to certain officers who were buried in the staff, and did not rise. "Ingalls, for instance," he said, "remained quartermaster of the Army of the Potomac during all the commands, and did a great work. Ingalls in command of troops would, in my opinion, have become a great and famous general. If the command of the Army of the Potomac had ever become vacant I would have given it to Ingalls."

Last year a well-known French naval writer, M. Maurice Loir, lieutenant de vaisseau, published, at Paris, "La Marine Royale en 1789."

The navy which bore so distinguished a part in our war for Independence must always have interest for us; while for the historian, the sailor, or the soldier, the curious and complicated organization which existed at that interesting period affords many subjects for study.

The work is confessedly modeled on M. Albert Duruy's "Armée Royale en 1789." The Revolution was soon to wipe out both organizations, which can now be studied in these works as things entirely apart from the military and naval history of the last hundred years.

The author of the "Marine Royale" tells us that, after the naval disasters of the wars of the Succession, and the Seven Years' War, public opinion seemed to be that France should remain exclusively a continental power, and should renounce the idea of maintaining a navy. "We even find a Minister of Marine—Berryer—taking, in war time, the extraordinary step of selling all stores laid up in the ports, and dis-

persing all naval supplies and resources." He actually sold, at public auction, provisions, timber, ropes, iron, and other things which are not got together in a hurry—of a suitable kind. The dock-yards were empty, and silence reigned in the building-slips and stocks.

This policy seems to have created little remark and no opposition, for the French were then at a low point of energy. When, in 1760, Canada was lost to France forever, a minister of state consoled himself by saying, "It's one charge less for the treasury." He had high authority for his remark, for the king himself, and Madame du Barry, had already announced, "Après nous le déluge."

Happily for France and for the French navy, Berryer was succeeded, in 1761, by Choiseul, who was also Minister of Foreign Affairs. A peace, which Voltaire said was as necessary for France as that people should eat and drink, enabled France to rebuild her navy, and great activity was at once instituted. As has been said, Choiseul found the dock-yards completely stripped, especially of seasoned timber for hulls and masts, but managed to have vessels rapidly built, and even acquired a fourth dock-yard for the state,—that of Lorient, which had belonged to the bankrupt Compagnie des Indes.

The Duc de Praslin, his cousin, who succeeded Choiseul as Minister of Marine, continued his work, extending the works at Brest, and sending out Bougainville on his exploring expedition in the South Seas, as a proof of the renewed vitality of the French navy.

When he gave up office, in 1771, he left France with sixty-four ships of the line, besides several on the stocks, all the material for the construction of a dozen more, and about fifty large frigates and corvettes ready for service. In other words, he had rebuilt a navy completely. France has given us wonderful proofs of ability to recover from temporary abasement since then, but seldom has anything more remarkable been done than this reconstruction. As M. Loir says, quoting Thiers, "Of all things which most require a strong determination on the part of the authorities of a nation, and great and consistent plans, we must place a navy."

De Boynes succeeded Choiseul, and then came Turgot, after a few months' tenure of office by De Sartine. In 1778 France possessed eighty-four line-of-battle ships, besides frigates and smaller vessels. There was only wanting an occasion to assert herself upon the seas. This came when our Revolution took place. All France, high and low, welcomed the Declaration of Independence, and when Franklin went as commissioner to Versailles, he was most cordially received; although, at first, Louis XVI. naturally held back from *fêting* the representative of people who had revolted against their king. But he had to give way. A treaty of commerce and friendship was made, followed by one of alliance. This last virtually declared war with England; and to this French alliance we owe the fact that indepen-

dence was obtained at the time it was. It would have come, at any rate, after fresh expenditure of life and means, but it was due to the French that it came when it did.

M. Loir deals most exhaustively with the French naval organization of the time,—curiously aristocratic in the admission of officers, much more so than the army; with the character of the seamen, the corps of naval gunners, etc., all exceedingly interesting to naval people.

A contemporary in Philadelphia remarks: "There is a project on foot to have the Legislature purchase the site on which the Continental army under General Washington was encamped in winter-quarters at Valley Forge, and maintain it as a State park. Of the many places famous in Revolutionary history, Valley Forge is probably the chief. It was while encamped there that the patriotic spirit of the Americans struggling for freedom from the yoke of Great Britain was exhibited to a greater extent than before or after. In the face of dreadful sufferings from starvation, cold, insufficient clothing, and disease, the ardor of the soldiers remained unquenched, and almost unparalleled was the forgetfulness of self on the part of civilians in their efforts to ameliorate the deplorable condition of the army. The stories of these self-sacrifices have been told and retold until nearly every man, woman, and child is familiar with them. To them, from its associations, Valley Forge has become as sacred almost as Independence Hall.

"The proposition, therefore, that the State take the site of the old winter-quarters is so eminently proper that it should meet with practically unanimous approval. In no other way can the fortifications thrown up during the winter of 1777 and 1778 be maintained for many years in their original condition as a military camp and for the enjoyment of the people.

"In addition to the propriety of taking this property at Valley Forge in order to preserve its historical elements, is the use which can be made of it as the annual camping-ground for the National Guard of Pennsylvania. For this purpose it is admirable in every way. The two hundred and fifty acres which it is proposed to take afford ample accommodation for the troops; it is easy of access, and the scenery of the proposed park and its surroundings is superb."

The Head-quarters of Washington, and a few acres about it, is already the property of a patriotic society, which has the solid stone house and its appendages in almost precisely the condition in which they were during that eventful winter, the turning-point in our history as a nation. The solid floors are the same which Washington paced when almost at his wit's end, but never despairing, and the great door-step, a fine broad stone, upon which the general so often stood during that particularly bitter winter, is still there. The Head-quarters might be

passed to the custody of the State, with the provision that Mount Joy and the great earthworks, still traceable, should be made one great State reservation.

If there is any truth in the saying that misery loves company, our naval officers should find some consolation in the statement afforded us a little while ago by an English service journal that the chances of promotion in that navy are not sufficiently great. According to an examination into the prospects of the line officers made by the *Manchester Guardian*, only one-fourth of the commanders who are made captains, and only one-twentieth of the lieutenants who are made commanders, can have any reasonable expectation of reaching their flags. This state of things reminds us of being told, in an early cruise, by an English officer, "I'm twenty years in her Majesty's navy, and nothing but a bl—y ould mate." The "mates" have been done away with, like our "passed midshipmen," but the changes in title do not seem materially to have advanced matters.

In the French navy there is the same complaint of stagnation in promotion.

It is a very difficult question in any service. There was the same stagnation before the Civil War in our navy, in spite of the "Star Chamber" Board of 1855. Yet the war was hardly in full progress when promotion came as if from the skies. At the end we had lieutenants of barely legal age, and very good ones they were, for they got their last step while in the performance of the most arduous service, and when being under fire was a weekly occurrence. "Equally significant," says the *United Service Gazette*, speaking of the prospect of promotion in the English service, "is felt to be the fact that the Retired Flag List is now nearly four times as large as the Active List, the Retired Captains' List is twice as numerous as the Active List, and that while there are three hundred and forty names on the Retired Commanders' List, there are only two hundred and thirty-seven on the Active List. The pensioned officers are now half as many again as they were in 1869. Then nearly every lieutenant promoted had an expectation of reaching his flag, but now not twenty-five per cent. of the commanders who have just been made captains can have any such hope."

Even "a bloody war and a sickly season" would not remedy this state of affairs. People in civil life will say, "Why not, in case of necessity, place many of these officers in active service again?" That will not do. The habit of service and the incentive of service once lost, men do not keep themselves abreast of the times. Even if vigorous and active, they will be found unfit for sea-service. The active men must come *up*, and not *down*, and so the English navy, like some others, is a little top-heavy.

So far as the writer knows, the old quarantine station for Philadelphia, on Tinicum Island, twelve miles below the city, is the only one which has always borne the title of "Lazaretto."

This establishment at Tinicum dates from 1799. But the first "Lazaretto" was established at Fisher's Island, as early as 1742, when the Provincial Assembly, in accordance with a recommendation of the governor, bought the island. It contained three hundred and forty-two acres, and several negroes belonging to the plantation were also purchased as an appurtenance to the land. This, says Mr. E. Leslie Gilliams, to whom we are indebted for these facts, was probably the first occasion upon which the Province of Pennsylvania became the owner of slaves.

At Tinicum, the present site of the Lazaretto, the United States government has an inspection and storage station. The increase of population in the vicinity and the prospect of cholera has caused the city to lease Little Tinicum Island, in the middle of the Delaware, opposite the present Lazaretto, for hospital and quarantine purposes. The Greater Tinicum is quite historic ground. It was taken up about 1635 by Olof Stillé, and on this island the fortress of New Guttenberg, and Governor John Prinz's house, and many others were built by the Swedish settlers. Prinz's house was a very fine one, of brick, surrounded by gardens, and was the official residence of the colony. In 1654 the Dutch overcame the Swedes and destroyed Fort Guttenberg.

Little Tinicum was, previous to the Revolutionary War, high and dry, from the carefully-built dykes of the Swedes and Dutch; but, in 1777, the people opened the banks to allow the river to come in, so as to prevent its use by the British against Mud Fort.

The "Battle of Dorking" had a well-deserved success, and the sincere flattery of imitation, *usque ad nauseam*, has followed that very remarkable production. Most of the imitators have confined themselves to a single incident or episode of some future war, so that the relation of supposed events becomes suggestive of thought, but not tiresome.

It seems as if that style of literature had been run to death, if we may judge from the recently-published book of over three hundred pages entitled "The Great War of 189-: a Forecast," in which are contributions, as correspondents, from a number of the most respectable English writers, with flaming towns, bombarding by balloons, and ramming by ships as illustrations.

These worthy gentlemen know what has happened before in war, and are as competent as any other to form an opinion of what will happen again; but can *any one* form a judgment of what will be the result when, as the writers of these papers suppose, war is on hand

from Vladivostock to the Atlantic, and from the Baltic to the Soudan, and even extending to New Caledonia and Australia?

As an opportunity for airing theories this sort of writing is a very good one; and now we should like very much to see a similar collection of opinions from the other side, from nations which are supposed to come to grief. *They* would be interesting also. But the other side, like B'rer Rabbit, "he ain't a-sayin' nothin'."

Towards the end of this volume there is a short *résumé* of the "general effects of the war." Of course it is entirely from the English point of view.

In this supposititious general war the English expedition from Australia against New Caledonia was too late, the French having gathered a superior force there from the Indian and Pacific Oceans.

The French restore Sierra Leone, which had been captured by a *coup* delivered from Senegal and Gorée. Then there ensues a final and definite settlement of the Newfoundland question.

No material change takes place in the present boundary between France and Germany. "Germany had no disposition to yield any of the Reichsland; France was in no position to demand it. Things on that frontier, therefore, remained very much as they had been, with just this difference, that France, no longer able to count upon the support of a baffled and impoverished Russia, was not likely to become aggressive for many years to come. A general disarmament was discussed, and some steps for reducing the armaments on all sides were actually adopted."

It seems rather a weak termination for so much smoke, and powder, and blood. We might add two well-known sayings,—"Nothing is changed," and "Those who live will see what happens."

Among the queer things in all this Hawaiian business is the tone of the English press. The only piece of bluster we have happened to see is that of a valiant London quill-driver (who, no doubt, belongs to the volunteers), and who says, "We should, no doubt, have to recapture the islands in case of war with America."

Why "recapture"? and why "America"? Does the man mean the United States? Probably he does. War may come between the two continents, but it is likely that even the most warlike of jingoes would dislike to cut off breadstuffs and cotton, lose Canada, and the tidy sum invested by John Bull in our broad country. Still, it might occur.

But this quill-driver was rather an exception. Most of the journals set out to advise us, in the most motherly, or, rather, grandmotherly style. It was like the small boy who wanted the moon, and grandma trying to convince him that, even if he had it, it would be cold and

smell of cheese. It seems rather queer from a nation of land-grabbers by profession to have come to us this kind of talk. One would think the inconsistency of it would strike the dullest and thickest-skinned of them. We are seriously told that we don't know what we want, and would be very sorry if we accepted these islands, and much embarrassed in our administration of the government. All this in a tone rather of sorrow and gentle admonition than one of anger.

The trouble with the average John Bull is that he cannot recognize that we are at least adolescent, if not entirely grown up; that the circumstances of the last century or so have changed a whole people; and that he is no longer the monitor of the world.

We can bear his criticisms and even his abuse with tolerable equanimity, but, for goodness' sake, let him spare us his friendly advice.

We have already quoted at some length from Captain Mahan's last work, but there are just a few lines which we would like to give as not inappropriate to the changed naval conditions of to-day. Speaking of Lord Howe's remaining so long and so much at Spithead, far in the rear of the French point of departure,—Brest,—the author remarks: "The only solution of the difficulty that the British government should have adopted was to maintain a reserve of ships large enough to keep the necessary numbers of efficient vessels cruising in the proper station. The experience gained by such constant practice, moreover, improved the quality of the men more than it injured the ships. Historically, good men with poor ships are better than poor men with good ships; over and over again the French Revolution taught this lesson, which our own age, with its rage for the last new thing in material improvement, has largely dropped out of memory."

In the peroration of his chapter upon the Berlin and Milan Decrees, and the Orders in Council, Captain Mahan says,—and we may be fortunate if those in authority in our own land lay his remarks to heart,—"The beneficent influence of the mass of conventions known as international law is indisputable, nor should its authority be lightly undermined; but it cannot prevent the interests of belligerents and neutrals from clashing, nor speak with perfect clearness in all cases where they do. Of this the Rule of 1756 offered, in its day, a conspicuous instance. The belligerent claimed that the neutral, by covering with his flag a trade previously the monopoly of the enemy, not only inflicted a grave injury by snatching from him a lawful prey, but was guilty, likewise, of a breach of neutrality; the neutral contended that the enemy had a right to change his commercial regulations in war as well as in peace. To the author, though an American, the belliger-

ent argument seems the stronger; nor was the laudable desire of the neutral for gain a nobler motive than the solicitude about their national resources, of men who rightly believed themselves engaged in a struggle for national existence. The measure meted to Austria and Prussia was an ominous indication of the fate Great Britain might expect if her strength failed her. But, whatever the decision of our older and milder civilization on the merits of the particular question, there can be no doubt of the passionate earnestness of the two disputants in their day, nor of the conviction of right held by either. In such a dilemma the last answer of international law has to be that every state is the final judge as to whether it should or should not make war; to its own self alone is it responsible for the righteousness of this action. If, however, the condition of injury entailed by the neutral's course is such as to justify war, it justifies all lesser means of control. The question of the rightfulness of these disappears, and that of policy alone remains." And now comes what we call attention to: "*It is the business of the neutral, by his prepared condition, to make impolitic that which he claims is also wrong.* The neutral which fails to do so, which leaves its ports defenseless and its navy stunted until the emergency comes, will then find, as the United States found in the early years of this century, an admirable opportunity to write state-papers."

We are reminded of the repeated efforts to recover the treasure of the frigate "Huzzar," in the Hell-gate (which treasure is not probably very great), by a statement in an article upon "Royal Naval Disasters," which appeared not long ago in the *Nautical Magazine.*

"One of the most remarkable wrecks during the latter part of that memorable century was the 'Lutine,' about which history has woven so much peculiar romance, all more or less inaccurate. She was a 32-gun frigate, captured from the French, and being exceedingly fast, with a most able commander, was selected by Admiral Duncan for the purpose of conveying, 'not treasure wherewith to pay our army in Flanders,' but an enormous sum of gold and silver bars, amounting, it is believed, to one million seven hundred and fifty thousand pounds, sent by various mercantile houses in London to Hamburg; her destination being Cuxhaven. This treasure-laden frigate weighed anchor in Yarmouth Roads at dawn of the 9th October, 1799, and was caught the same day in a northwest gale, which drove her so far to leeward that at midnight she struck on the sands of Fly Island, at the entrance to the Zuyder Zee, and quickly, in a furious surf, became a total wreck, with the loss of all hands save one, who himself died from exhaustion soon afterwards. From time to time, when a heavy northwester uncovers the hull of the 'Lutine,' some portion of the treasure is secured; but it has been computed that upwards of a million and

a half in gold and silver bars, Spanish pistoles, double louis-d'ors, and English guineas still remain within her historic timbers."

A naval engagement which seems hitherto to have escaped the attention of historians is mentioned in the *Rixæ Oxonienses*, by Mr. Hulton: Oxford, 1892. In speaking of the reaction which set in, in manners and morals, after the Restoration, he says,—

"In 1675, Cornelius Van Tromp, the famous Dutch admiral, visited the University. 'He insisted on having salt meat, and declined the Doctor's degree offered to him, thinking, as a seaman, that title to be out of his element. Speed, of St. John's College, M.D., stayed in town on purpose to drink with him, and gained a greater victory over the Dutchman than all the sea-captains in London; for one evening, mustering up five or six more as able men as himself at wine and brandy, he got Van Tromp to the Crown Tavern, and there so plied him with both that at twelve at night they were fain to carry him to his lodgings.'

"In the early days of Oxford the students and towns-people fought to some purpose, for many are the deaths recorded from arrow and sword and club. In the Stuart times they were as disorderly, but 'with a difference.'

"'When the Mermaid Tavern broke, the Christ Church men were blamed, their ticks amounting to fifteen hundred pounds.' Charles II. twice visited Oxford, but no increase of propriety seems to have resulted from the royal visits. 'Barbara Villiers, Duchess of Cleveland, brought up her son, Charles Fitzroy, a "very kockish, idle boy," to hand him over to the Dean of Christ Church, and before her departure sat at least an hour in her coach, that everybody might see her.' The free manners of the time found entrance even into Christ Church. Benjamin Woodruffe, a canon, 'stood with a lady in the great window next to the quadrangle, and was seen by Mr. Dean and almost the whole House toying with her most ridiculously, and fanning himself with her fan almost all the afternoon.'"

Here is an incident which suggests an occurrence in an Eastern college in our own land not a year ago. The only difference is, that the tables were turned. "Discipline was totally disregarded. On one occasion a company of players, who had not taken as much money as they expected, went through the town at night and broke the windows."

"Towards the end of the reign of Charles II. the University showed its sympathy with the Duke of York during the trying times of the alleged Popish Plot of 1678, and the Exclusion Bill of 1681. In 1682 'bonfires were made in several parishes by the Tory party after supper, for joy that Lord Norris was made Earl of Abingdon, with the ringing of bells. Several colleges had bonfires, All-Souls'

especially. About eleven at night they brought out a barrel of beer from the cellar, and drank it in healths on their knees to the Duke of York and Earl of Abingdon, out of the buckets that hung up in the Hall. They got about twenty of the trained bands of Oxford, who discharged at the drinking of every health; they had wine in plenty from the tavern over the way, guarded by a file of musketeers; they had a drummer that beat round the college quadrangle and at the gate.'"

Many persons in our country will remember the fire-buckets of leather, and well painted, which adorned the halls of houses, public and private. There are few of them left now, and those which are left ought to be very carefully preserved.

Some weeks ago an editorial appeared in the *Army and Navy Gazette* which summarized the results arrived at by Captain Molard, of the St. Cyr Military College, in regard to the present military strength of the armies of Europe.

We venture to again condense the editorial in question, confining ourselves to the major facts.

By a compiled table Captain Molard shows that the coming century will—so far as the European world is concerned—be ushered in under an escort of twenty-two and a half million bayonets. In twenty years Europe has doubled her armed strength; in thirty years from 1870 she will have trebled it.

Captain Molard says that Count Caprivi is wrong in his estimate of the balance of military force, and that the advantage at present is in favor of the triple alliance. "The figures show at what cost France is preparing for the next big struggle. The broad facts set out are that the French have spent on their army, in the twenty years from 1872 to 1893, about six hundred millions sterling;" which is almost equal to the national debt of Great Britain. If the cost of pensions and of strategic railroads be added—which are both military expenses—"the total is seven hundred and twenty million pounds,"—say three billion six hundred million dollars. This does not include all. There is the French navy,—a fine one to be sure,—"which during the same period must, judging from the present expenditure," have cost about one hundred and seventy million pounds,—say seven hundred and seventy-five million dollars.

These sums are almost inconceivable to the ordinary mind, which has trouble in grasping the expenditure, or rather the waste, incident to the Panama business, which is a drop in the bucket compared with the cost of preparations for the "great revenge."

About two-thirds of the taxation goes to pay for either past wars

or for warlike preparation, and one-third for all other purposes,—education, post-office, religion, justice, colonial services, etc.

"The French want their revenge, and until they have got it it is hopeless to expect of them that they will quickly rest under the stigma of a defeat such as that they suffered twenty-two years ago. Nor is it to be supposed that they will delay the pending struggle longer than is absolutely necessary. Everything tends to show that a few years will witness a campaign in Europe the like of which has never been seen before. If any doubt this let them look carefully into the figures we reproduce above, and ask themselves, Would the principal continental nations put forward the efforts, and submit to the financial strain which they do, unless they realized the full danger of the situation and the necessity which exists for them to be prepared for the war-storm when it comes?"

The report comes, through the newspapers, that his Majesty the King of Siam lately ordered a portion of his army—in garrison, and presumably not otherwise employed—to catch flies. Every man was to produce a match-box-full every day. The size of the match-box is not given in the accounts we have seen. Well! soldiers such as those of the King of Siam might be worse employed; at the same time, it would make a capital scene for a comic opera.

Well does the writer remember an almost similar performance during his first cruise. The first lieutenant, thinking that the cockroaches on board could be exterminated, ordered each boy, when he appeared at muster on the forecastle at seven bells in the morning-watch, to produce a mustard-bottle-full of the insects. The bottle was then emptied by the ship's corporal, so that the "game" should not serve again.

A boy who was found dirty too often at these morning inspections made acquaintance with the breech of No. 1 gun, where he received admonition by means of the "boys' cats." If a boy was lazy and did not catch his quota, or attempted to appropriate the labors of others, he was apt to taste of the master-at-arms' rattan.

This latter instrument was a great persuader, by the way. When all hands were wanted on deck, and the word was passed, the master-at-arms gave some sharp taps on the berth-deck ladder, which had a wonderful effect in hastening the movements of berth-deck cooks and other speluncal dwellers. The last one up the ladder generally got a sharp cut from the rattan; but we never could see the justice of that, for there must always be a last man.

When this was remarked to the master-at-arms, he merely said, "But it's never the same one who's last, sir." That was probably true, for the grizzled veteran had no light hand.

The French officer, the Commandant Monteil, who lately returned from a most successful expedition to Bornou, which occupied twenty-seven months, was successful in an unusual degree, for certain members of the Royal Niger Company had been unceremoniously hustled out of the country just before his arrival.

Monteil reached Bornou in March, 1892, and "was met by a lance salute,—that is to say, the native cavaliers came down on me at full speed, yelling like mad, and bringing up with the points of the lances almost in my face. I was surrounded by these demons, brandishing their razor-edged lances so as almost to touch me. Although I had been warned beforehand, it was hard to appear unconcerned."

After submitting to this rather trying ordeal he seems to have been received into high favor, and in April was received by the Sultan in full state, as the accredited representative of "King Carnot." Among other presents he presented his Majesty the Sultan with a copy of the "Thousand and One Nights," in Arabic, which made such an impression that he was more than ever *persona grata* at the court.

Monteil's return was more difficult than his outgoing. His objective-point was Tripoli, and he had to wait four months at Kouka for the formation of a caravan. He then marched along the line of demarcation between the "French and English spheres of influence," and then made his way north. The heat was terrible. Their camels died, and they had to carry their own food and necessaries. At Mourzonk, which they reached in the latter part of October, 1892, they were at last out of danger from the desert tribes, and were enabled to buy beasts of burden. In November they were at Sokna, at Beni-Oulad in December, and reached Tripoli on the 10th of that month.

When we consider the fanatical disposition of the peoples among whom he passed twenty-seven months of most arduous work, Commandant Monteil must be surely ranked among the great travelers.

The *Electrical Review* remarks that, "For some time past it has been remarked that ships at sea are far less often damaged by lightning now than was formerly the case when wooden ships were so much in vogue. This has been noticed even under the tropics, where violent storms are very frequent. According to some returns made of the statistics that have been accumulated since 1879 by the German authorities, this must be attributed to the general use which is now made of wire rope for rigging purposes, as well as to the fact that the hulls of ships are usually constructed of iron or steel. Thus the whole ship forms an excellent and continuous conductor by means of which the electricity is led away into the ocean before it has time to do any or serious damage. Captain Dinklap, who has had charge of the commission appointed to investigate this question, states that no case has

been recorded where a ship rigged with wire rigging has sustained any damage from lightning, except in a few instances where continuous connection had not been made with the hull. But wooden ships rigged with ordinary rope rigging still show the same percentage of casualties as formerly, when they are not properly fitted with lightning-rods and the proper precautions taken to maintain their efficiency."

Was it Columbo or Trincomalee, where so many ships used to be struck by lightning? We really forget now, and it is a matter the importance of which has almost passed away. There used to be certain regions where the damage by lightning was a calculable quantity, and of which we hear much less nowadays, even among wooden vessels. The latter have conductors, and never thought of having such things in former times.

In the days of the old navy, forty years ago or more, the conductors were most crude. There was an iron spindle, from six to ten feet long, according to the size of the ship, which went through the main truck, and from this led down a long-linked affair, something like an old-fashioned surveyor's chain, stopped to the top-gallant backstay. In ordinary weather a few fathoms of this conductor were stowed in the main chains, and at the first appearance of lightning was dropped overboard, and trailed in the water. After this copper rope or wire was used, connecting permanently with the vessel's sheathing in varying ways.

A remarkable proof of the value of even the primitive linked affair occurred on board a sloop of war in which the writer was serving in 1852. The ship was coming out of Table Bay, Cape of Good Hope, and not far from Robben Island. It was a nearly perfect day, with a pleasant, fair breeze. Rather suddenly a very small, well-defined, egg-shaped cloud was observed, hardly looking as big as an ordinary dining-table, rapidly passing across the heavens. More from routine than anything else, the conductor was dropped overboard, and not too soon, for as this "little cloud out of the sea, like a man's hands," reached the zenith, there came such a peal and flash as it is seldom one's lot to hear or see. For a moment every one was paralyzed, but no real harm was done. The iron spindle, torn from the main truck, came point downward, and stood quivering in the deck by the starboard gangway, the carpenter escaping impalement by about a foot. There it stood and quivered, upright. The links dropped on deck, with many drops of molten metal, which made their marks in our white planks. The cloud, after this single discharge, entirely dispersed, and there were no traces of it to be seen. Will the dynamite balloons behave like this?

E. SHIPPEN.

NAVAL AND MILITARY NOTES.

NOTES AND DATA ON NAVAL AND MILITARY MATÉRIEL AND ALLIED SUBJECTS.

It is the intention to collect and publish in this department of the "United Service" all information obtainable from current publications and other available sources concerning ships, guns, armor, explosives, small-arms, military and maritime affairs, and kindred subjects. As the data are derived largely from unofficial sources, strict accuracy cannot be expected; but all reports will be carefully examined and compared with others on the same subject, and it is hoped, by this means, to attain fairly correct results. Erratum notices will be published whenever errors are discovered in data previously given. As the development of the present plans for collecting information progresses, it is hoped to secure fuller and more authentic reports.

WAR-SHIPS AND TORPEDO-BOATS.

Great Britain.

On the 8-hour natural-draft trial of the torpedo-gunboat *Circe*, the results were as follows: Steam, 140; vacuum, 27; air-pressure, 0.8; revolutions, 223.8; I. H. P., 2618; speed, 18.27. On the forced-draft trial the I. H. P. exceeded 3500; but, as the weather was rough, the speed was not recorded.

The *Devastation* is being refitted at Portsmouth with new engines and boilers, which are expected to give her a speed of 16 knots. The original turrets are to be retained, but refitted to admit 10-inch B. L. guns arranged for working by hand or hydraulic gear. The protrusion of the new guns is balanced by two hundred projectiles stored on the opposite side of the turret.

The *Howe* was floated on March 30 and towed into Ferrol, where she will receive sufficient repairs to enable her to reach England.

The battle-ships *Magnificent* and *Majestic* will be taken in hand without delay. They are to be sister ships. The former will be built in Chatham, and £180,000 will be spent on her during the next year. The latter, to be laid down at Portsmouth, has had £81,900 allotted for construction work during the same period. The details, so far as given out, are as follows: Length, 390 feet; beam, 75 feet; displacement, about 14,500 tons. The maximum I. H. P. will be about 13,000; corresponding speed, 18 knots; the natural-draft speed is expected to be about 16.5 knots. The battery will consist of four 46-ton, 12-inch, wire-wound guns, mounted in two barbettes; twelve 6-inch, 5-ton, rapid-fire guns; eight 24-pounder, eight 6-pounder, and twelve 3-pounder rapid-fire guns. One torpedo-tube will be fitted in the bow, one in the stern, and one submerged tube on each broadside.

The protected cruiser of 5500 tons and 9000 I. H. P., referred to in the April NOTES as building at Chatham, is named the *Minerva*. Her length on the water-line is 350 feet, beam 53 feet. The expected speed with forced draft is 20 knots, natural draft 18 knots. The battery consists of five 6-inch, six 4.7-inch, eight 6-pounder, and one 3-pounder, all rapid

fire; also four Maxim machine guns, four 18-inch torpedo-tubes arranged as in the *Magnificent* and *Majestic*. The maximum indicated horse-power is now said to be 9600, instead of 9000 as previously reported.

France.

The protected cruiser *Descartes*, recently laid down at Nazaire, is of the following dimensions: Length, 315 feet 11 inches; beam, 42 feet 3 inches; draft forward, 16 feet 11 inches; draft aft, 21 feet 5 inches; displacement, 3988 tons. The hull is of steel, sheathed with wood and coppered. The double bottom and protective deck are complete. The thickness of the latter is 1.6 inches on the slope amidships, 1 inch forward and aft. The conning-tower of steel is 2.75 inches thick in the forward side, 1.6 inches on the after side. The communication-tube is 3.15 inches. There are two military masts with 3 tops each: the lower for a lookout, the middle for four 3-pounder R. F. G., the upper for 37-mm. R. C. and search-lights. The battery will consist of four 6.3-inch B. L., ten 3.9-inch R. F. G., fourteen 3-pounder R. F. G., eight 37-mm. R. C.; and there are two torpedo-tubes, one on each side amidships. The upper works are cut away in steps so that the 6.3-inch and 3.9-inch guns all fire in line with the keel, either ahead or astern. There will be six sets of Belleville boilers, carrying a pressure of 242 pounds per square inch. The estimated I. H. P. is 8500 with forced draft; the natural draft power to be 95 per cent. of that with forced draft; the sustained I. H. P. for twenty-four hours to be at least 5500. The speed with forced draft to be 19 knots, natural draft 18. The coal capacity at load draft is 556 tons, with radius of action 5000 knots. The total bunker capacity is about 725 tons.

The *Dupuy de Lôme* is being rearmed with rapid-fire guns, necessitating some changes in her upper works.

The lightly armored cruiser *Charner* was launched at Rochefort March 18. The description given in *Naval Intelligence Report* No. IX., page 27, agrees with the latest report as far as it goes. The turrets of the 7.48-inch and 5.5-inch guns and the conning-tower, are 3.6 inches thick. The secondary battery consists of four 2.56-inch R. F. G., six 3-pounder R. F. G., and six H. R. C. There are five torpedo-tubes, two forward, two amidships, one aft. There are two military masts, with three tops, each similar to those of the *Descartes*, and two of the six 3-pounders are mounted in each of the middle ones. The other two 3-pounders are on the upper deck aft, one each side. The 2.56 guns are in broadsides abreast the smoke-stacks. There are six search-lights.

The torpedo-boat *Forban*, to be built by Normand, is to have a speed of 30 knots, or 34.5 statute miles.

Italy.

The torpedo-gunboat *Aretusa* has completed her steam trials. The I. H. P. was 4422, mean speed for 8 hours 20.7 knots; the maximum speed was 21 knots and speed with natural draft 18 knots. The *Aretusa* was built by the Orlando Bros. of Leghorn. Her dimensions are: Length 229 feet 8 inches, beam 26 feet 10 inches, mean draught about 12 feet, and displacement 846 tons. The battery consists of one 4.91-inch R. F. G., six 6-pounder R. F. G., and perhaps six smaller pieces. There are six torpedo-tubes; five on deck, training, and one fixed in stem. There are two vertical, triple-expansion engines driving twin screws, and four locomotive boilers. The protection consists of a light protective deck, and coal stowed abreast machinery. The coal supply is about 175 tons.

Argentine.

The light-draft armor-clad *Independencia*, a sister ship in all respects to the *Libertad*, described in the April and May NOTES, has completed her steam trials. The speed with natural draft was 13.5 knots.

Brazil.

It is stated that, in consequence of the situation exposed in a remarkable report addressed to the Brazilian Chamber and Senate by Admiral José di Mello, Minister of Marine, four battle-ships, six

first-class cruisers, and six torpedo cruisers are to be built for the Brazilian Navy. The majority of these ships will probably be ordered in France. This will make Brazil a naval power of no mean importance, and her navy almost equal in strength to that of the combined fleets of the other South American countries.

Haiti.

The *Alexandre Petion* was recently launched at the Graville yard, Havre. Her length is 141 feet, speed 14 knots. The battery will consist of one 3.9-inch Canet R. F. G., and four 3-pounder R. F. G A sister ship is building at the same yard.

United States.

All the armor for the *New York* and *Monterey* has been completed, so that these vessels will not be longer delayed. A considerable portion of the side armor of the *Terror* has been received at the New York yard and is now being put on.

The *New York* on her preliminary contractors' trial developed a speed of 20.57 knots. Before the official trial takes place her smoke-stacks will be lengthened 20 feet and some minor changes made.

Mr. Holland's design for a submergible torpedo-boat, which he has placed in competition with the Baker boat, differs very materially from the latter. The dimensions are: Length 135 feet, beam 16 feet, depth 10 feet 6 inches; displacement light 296 tons, submerged 352 tons; weight of water ballast 56 tons. The protection to the hull consists of one-inch steel plating above the light water-line, cellulose between inner and outer hulls, and four feet of water above the hull when fully submerged. The conning-tower will have 24 inches of armor in front, and 5 inches on the sides and rear. When going into action the admission of the water ballast brings the top of the hull two feet below the surface. At this point it is sustained by the buoyancy of the conning-tower. When near the enemy the diving rudders produce a further submergence of two feet. The conning-tower is a sort of closed armored redoubt of nearly circular form protecting the base of the smoke-stack and an air-shaft, as well as the pilot-house proper. The armament is to consist of two submarine guns, one forward, one aft; two aerial torpedo-guns similarly placed, and one 3-pounder R. F. G. The fuel supply, of coal or petroleum, is 25 tons. The engines are twin screw, of the usual vertical triple-expansion type, and of about 1500 I. H. P. The estimated speeds are 18 knots when light, 15 knots submerged. The crew consists of 15 officers and men.

The circular to bidders relating to submarine torpedo-boats was signed by the Secretary of the Navy on April 21. Bids will be received from responsible builders within the United States, domestic materials to be used. The boats are to be fully described in the plans submitted by them; but all properly prepared plans unaccompanied by such bids will be received and carefully considered. The general requirements to be fulfilled in the design and trial of a submarine torpedo-boat, stated in the order of importance, are as follows: 1, safety; 2, facility and certainty of action when submerged; 3, speed when running on the surface; 4, speed when submerged; 5, endurance when submerged and on the surface; 6, offensive power; 7, stability; 8, visibility of objects to be attacked. The speed on the surface should be as great as possible and is more important than the speed submerged. The boats should be planned to run on the surface except when necessary to avoid detection or pursuit. Means should be provided, capable of being readily applied, for reducing the boat's displacement when running on the surface to the necessary weights to be carried. The speed when submerged must be sufficient to enable her to attack a ship under way and running at a considerable speed. The displacement should not exceed 150 tons, and may be as much less as will enable the constructor to embody the above features in the highest degree.

HEAVY GUNS.

Krupp's principal exhibit at the World's Fair, the 30.5- and 42-centimetre guns, arrived at Baltimore on the steamer *Longuiel* about the middle of March. The 42-centimetre (16.5-inch) gun weighs 124 tons, or about 277,000 pounds, and is the heaviest piece of ordnance ever constructed.

It is a new departure in ordnance to build a gun to fit a projectile, but this is being done at Woolwich. The British Army Ordnance Department has a large quantity of antiquated 20-pound 4-inch shell on hand, and the authorities in charge have insisted on having some guns made to use them. The gun-factory officers have opposed the idea on the ground that the projectiles are antiquated and worthless, as a 20-pound shell is entirely too short for a 4-inch calibre, but they have been overruled.

The number and different kinds of guns completed and under construction at the Watervliet Arsenal are as follows: Fifty 3.8-inch field guns; twenty-four 3.6-inch field guns; twenty 7-inch howitzers; twenty 5-inch siege guns; twelve 8-inch rifles; twenty-three 10-inch rifles; fifteen 12-inch rifles; and two 10-inch rifles, wire-wound. Of the 10-inch guns, eight are completed; one 12-inch has been sent to the proving-ground, and by May 5 more will be ready. All the 8-inch are finished.

The hydraulic machinery of the Spithead forts, constructed in 1876, is to be replaced by new machinery of recent design.

Further tests of the Brown segmental, wire-wound gun were made at Birdsborough, Penn., on April 15. It is reported to have withstood a pressure of over 60,000 pounds without injury.

The reports concerning the establishment of a gun-factory and ordnance and armor plant on the Pacific Coast are confirmed. It will be connected with the Union Iron-Works, and is to be called the Union Gun and Forge Company. It is said that $5,000,000 will be spent on the works.

All of the condemned 6-inch Mark II, 5-inch Mark I, 4-inch of 13-cwt., and 22-cwt. Mark I, British naval guns, have been withdrawn from service and replaced by pieces of later type.

RAPID-FIRE, MACHINE, AND FIELD GUNS.

The British Navy has practically adopted the new model 12-pounder for a boat and field gun in place of the present 9-pounder. It is a rapid-fire piece (about 4 rounds per minute under service conditions) with single-action breech mechanism. A recoil mount, with long slides to reduce the shock of firing, is fitted for boats. The field mount is the usual carriage without a brake. The very considerable recoil is accepted in preference to a brake apparatus which might jam at a critical moment and give serious trouble.

The new types of Krupp field guns, 30 and 38 calibers in length and of 2.24-inch caliber, have recently been tested. The ammunition is put up in the usual rapid-fire form. The following weights for the two types are in pounds: Tubes 474, 660; carriages 924, 1188; unlimbered guns 1417, 1869; guns fully equipped with limbers containing 48 rounds each 3067, 3540. The initial velocities are 1378 and 1640 feet per second. No defects were developed in the tests, which were considered satisfactory in all respects.

A new rapid-fire gun, the invention of C. W. Sponsel, of the Pratt & Whitney Works, was tested at Indian Head, April 8. One hundred rounds were fired. A speed of five shots in twelve seconds was attained by an inexperienced hand. A practised gunner, familiar with the working of the piece, was able to fire at the rate of thirty-five to forty shots per minute. The special features of the gun are in the breech-block, the operating lever, extractor, locking arrangements, non-liability to jam or failure to work on account of dirt or defective cartridges, simplicity and economy of construction, and the ease and rapidity

with which the parts can be disassembled or assembled. All the moving parts of the breech mechanism, including the extractors, are contained in the breech-block. The extractors exert a direct pull parallel to the axis of the bore, and the ejective force is unusally strong.

TORPEDOES, TORPEDO-NETS, AND TORPEDO-GUNS.

Following are the conclusions of the *Vesuvius* trial board:

"In the endeavor to determine the value for naval warfare of the pneumatic guns for discharging torpedoes installed on board the *Vesuvius*, the question of accuracy attracts most attention. Thirty-one of the projectiles fired by the board for range were dummies and twenty-one were service projectiles, which, being turned on the outside, are smoother than the dummies. This difference of surface may perhaps affect the range somewhat, but its influence, if any, did not appear.

"After an extended consideration the board has decided that, while the accuracy of these guns leaves a good deal to be desired, it is still reasonably sufficient for the purposes of naval warfare in comparatively smooth water, the only condition under which the board has been able to carry on the tests. The value of the guns is increased by the fact that the projectile contains a heavy charge of high explosives, and also that this explosive can be safely discharged when the projectile that contains it is armed with a fulminate fuse, and though the particular fuse used in the trials has failed to perform its functions, it is evident that it can be safely fired from the guns.

"One of the chief merits of the system is that its usefulness begins at about the range where that of the automobile torpedoes now in vogue ceases; and while it is true that daylight is necessary in order to best utilize these ranges, it is thought that a vessel so armed would still be useful at night for annoying groups of hostile ships, firing upon harbors, dock-yards, etc. The usefulness of the system at night is increased by the fact that there is no flash or smoke from the guns, and that the report when projectiles are used is comparatively light; indeed, with the vessel to leeward, or if a side wind of moderate force should prevail, it is doubtful whether the report would be much noticed. In the daytime a vessel carrying such guns could successfully attack under cover of fog or smoke, or under the shelter or protection of our armored or other ships; she could also be conveniently used in rivers or bays by firing from behind trees or points of land, from which positions she would be able to make fair practice, and, owing to the absence of smoke, would not be so readily discovered as other vessels.

"The board is aware that the firing of high explosives from powder guns, of late years, has made progress, and very likely before long the firing of heavy charges from such guns may be generally introduced, and if so, it is quite probable that the value of the pneumatic guns may be lessened; but it is to be observed that such powder-guns have not yet made their appearance in the navy, and it is uncertain when they will do so. When they do appear, perhaps they may prove to be simpler in mechanism and more accurate in practice than the guns of the *Vesuvius*, but the board has no positive evidence on this point at present, and therefore is uncertain to what extent this superiority may obtain, and are also uncertain to what extent the pneumatic system may be improved. In order to form a judgment as to the comparative accuracy of the two kinds of guns it would be well to compare the probable rectangles, etc., of the pneumatic guns with those of a rifled mortar or howitzer that would project equal weights of high explosives over equal ranges. But however these matters may ultimately be decided, the board is of opinion that the pneumatic system, as installed on board the *Vesuvius*, is, on the whole, of decided value in naval warfare, though the fuse is quite defective, and several other points connected with the mechanism of the guns require attention. It is also thought, judging from the comparatively superior endurance of the middle gun, that the system is capable of mechanical improvement,

and that the guns can probably be made to work more nearly together than they do now.

"The board has observed the following points in which improvement would be desirable as tending to the most perfect working of the system:

"The fibre-buffers used in the mechanism do not appear to resist well the hammering of the parts which they cushion; they also appear to swell and flake when much moisture is present, and thus the range and accuracy of the guns is injuriously affected. The buffers should, if possible, be made of some harder and more durable substance.

"It would be well if some means were taken to prevent the entrance of undue amounts of moisture into the system, as the presence of moisture affects the buffers as above mentioned.

"Valves should be provided to isolate each gun from the others and from the firing reservoirs, in order that a disabled gun could be thrown out and repaired while the others were in use."

SMALL-ARMS AND EQUIPMENTS.

Brazil is reported to have ordered 70,000 rifles from the Mauser Company, Berlin.

Recent experiments with rifles of 6½-, 6-, 5½-, and 5-millimetre calibre are said to show the great advantages of the 5-millimetre bore. The chief point seems to be the greater number of cartridges which can be carried per man; but the diminished recoil and slightly greater resulting accuracy, greater flatness of trajectory, equal penetration, and longer range were additional points in its favor.

The trials of the textile cuirass at Mannheim,—details of which are published in the German papers,—appear to indicate that it really does afford a considerable measure of protection. At 400 yards it was absolutely bullet proof; and even at 100 yards the bullet did not pierce, but the shock would probably cause unconciousness and temporary disablement. The cuirass, which weighs 6 pounds, is made of the same material as the tunic, treated by a process which is the inventor's secret.

The conflicting reports in regard to the character of the wounds inflicted by the small-caliber bullet seem to be due to the difference in the ranges at which the experiments were conducted, and to the difference in the construction of the bullet itself. The very serious wounds at the shorter ranges are caused by the steel envelopes, which flatten out and tear their way through flesh or bone with appalling results. At ranges varying between 300 to 1200 yards this envelope seems to separate from the body of the projectile. The denuded leaden bullet then makes a small, perfectly clean hole through flesh or bone without shattering the latter or causing destruction of surrounding tissue.

GUNPOWDER AND EXPLOSIVES.

A Mexican company will shortly begin the manufacture of dynamite. All supplies have hitherto been obtained from the United States.

Unfreezable dynamite, invented by Liebert, is produced by adding iso-amyllic nitrate to the dynamite, by which the freezing-point is lowered from 40° above zero to 50° below it.

Cordite continues to give satisfactory results. The British naval authorities are only waiting for the final report of the Ordnance Commission to adopt it for general use in the service, when it will replace all powders hitherto supplied for rapid-fire guns. It is invariably made in "macaroni" form, and the following are the diameters in inches for the various calibers: for the .303 Lee-Metford magazine-rifle, .039; for the 3-inch, 12-pounder field gun, .078; for the 4.7-inch, .157; for the 6-inch, .275. The German Wetterin smokeless powder is in the form of cubes; that for the 9.45-inch, 18.7-ton gun measures .75 of an inch each way.

A new explosive, designed by Dr. Weiss, of the Gera dynamite factory, for use in small arms, is being experimented with by a German military commission.

It is a brown, fatty substance of the consistency of congealed oil at ordinary temperatures, which it retains up to 112° F. It requires a detonating substance to explode it, and is insensible to shock or a spark. The smoke produced is almost invisible, and the recoil is slight even with the heaviest charges. The heating of the piece by rapid firing is not sufficient to interfere with its continued use, the residuum in the bore is slight, and the explosive is easily adapted to mechanical loading.

ARMOR.

Five hundred tons of 12 inch nickel-steel armor for the *Texas* has been accepted as the result of the successful test of a trial plate at the Readington proving-grounds. The plate tested was 16 feet long, 8 feet 4 inches wide, 12 inches thick, and weighed 30 tons. Three shots were fired from an 8-inch gun. The projectiles were Holtzer armor-piercing, weighing 250 pounds. The first shot, with 79 pounds of powder, gave a velocity of 1678 feet per second. The penetration was 14 inches. The projectile rebounded and fell to the ground a short distance in front of the plate. The second shot was fired with a charge of 110 pounds of powder, giving a velocity at impact of 2004 feet per second. The projectile penetrated the plate and backing. The third shot, with 91 pounds of powder, and a velocity of 1833 feet per second, penetrated 15.5 inches. The projectile rebounded and fell in front of the plate. The points of impact were 28 inches apart. The plate was neither broken nor cracked. All three projectiles were somewhat upset but not broken.

The following notes on the trial of the 14-inch Harveyized plate, February 11, 1893, are supplementary to those given in the April number. The projectiles used were Holtzer armor-piercing. The plate was backed with oak and securely braced; its distance from the muzzle of the gun was 385 feet.

The first shot, with a velocity of 1472 feet, struck the lower right-hand quarter. The projectile was smashed on the face of the plate; penetration about 2 inches; the point remained welded in the plate. There were no cracks formed, and the backing was undisturbed and uninjured; plate cool and surface not dished; pieces of projectile very hot.

The second shot, with a muzzle velocity of 1859 feet per second, struck the upper left-hand quarter. Penetration about 5 inches. Projectile broke up, leaving the head in the plate; light surface scaling ¼ to ½ inch deep around point of impact. A deep crack, extending completely through the plate at the left edge, ran through the point of impact of the second shot towards that of the first, decreasing in depth all the way; plate warm about shot-hole and pieces of projectile very hot; target set back elastically about 1 inch.

The third shot, muzzle velocity 1959 feet per second, struck the upper right-hand quarter and penetrated about 6 inches. Projectile broke up; head, much upset, welded in plate; scaling repeated; through crack to top of plate and downward diagonally to the left to meet crack previously formed between impacts 1 and 2, and this latter crack was extended a little farther to the right and then downward to the lower edge of the plate. The piece of plate defined by this crack, embracing a little over one quarter of the whole plate, was the fragment against which the last shot was directed. A fine crack was also opened from the third point of impact to the right side of the plate, and another from the second point of impact to the upper edge. The target was set back about 2 inches; recovering 1 inch; 1 vertical timber broken; all bolts and fastenings intact. Up to the third round the plate remained an entire mass, resisting with its full weight the force of the projectiles.

The fourth shot was directed at the lower left-hand fragment above referred to, with a muzzle velocity of 2059 feet per second. The projectile broke up, the head welded to the piece of plate forming the right side of shot-hole. The two small pieces of plate, forming the left side of shot-hole, were wedged clear of the head, but were not detached from the target. The penetration was 10 to 11 inches. All cracks were slightly widened. The plate was now in 7 pieces,

all remaining on the target in their proper position. No bolts were broken. The usual scaling took place about point of impact. The backing was uninjured except that the great force of the blow distributed over such a small surface had compressed the timber behind the piece of plate struck; the amount of compression was about an inch. All the steel channel-bars in rear of the piece of plate forming the last target were somewhat buckled, but the wooden filling between them gave full support to the blow.

SYNOPSIS OF TEST.

No. of shot.	Energy, f.-t.	F.-t. per ton of plate.	Penetration, inches.
1	7,520.9	470.5	2
2	11,995	749.7	5
3	13,320	832.5	6
4	14,715	[1]3344.3	10 to 11

The following extract from Ensign Dashiell's official report of the trial is so concise and exactly to the point that it is given verbatim:

"Considered externally, the plate fulfilled the requirements of the ideal plate; it resisted and broke up four projectiles of standard armor-piercing qualities, fired with velocities varying from those that would obtain at the commencement of an action at moderate range to those that would be reached by a high-power gun at 100 yards or close range. It protected from all injury the backing upon which it was mounted, even under the severe conditions of the last shot, when a fragment less than one-third of the plate was attacked by the heaviest energy employed in the test, and the plate has shown itself more than a match for any 10-inch gun afloat.

"Regarding the plate as a protection for a ship, more is to be considered than the mere breaking up of, and perfect resistance to, all the projectiles fired at it. The question of the absorption of the energy of the blow is the cardinal point in the case. Armor, if made thick enough, can stop any projectile; but the energy, if the projectile is not broken, goes into the plate, thence into the structure in rear, and the shock and racking effects are very serious. In the case of the Harveyized plate, nearly all the energy of the blow went into the projectile in the first round, the percentage becoming less and less, of course, as the velocity increased; but even in the last round a very large part of the energy went towards breaking and heating the projectile. This plate was mounted upon the same structure and with the same structural resistance as the 14-inch nickel plate of the *Indiana*. The weights of the plates were 25 tons to 16 tons in favor of the 14-inch nickel, and the striking velocity on the latter plate was 1384 feet per second, or nearly 100 feet per second less than that of the first round on the Harvey plate.

"Yet the heavier plate was on each round set back, and the structure was racked very much more than was the case with the lighter Harvey plate of the same thickness with shots of 1472, 1859, and 1959 feet per second.

"As was to be expected, the last shot with 2059 feet at the 4.4-ton fragment of the Harvey plate racked very severely the backing and structure on that side, but it could have still stood against another round. The difference is due to the distribution of energy,—if into the projectile, the structure or vessel is but little racked; if into the plate, the structure suffers. These features were so clearly shown in this test,—more clearly than in any former trial,—that I take this opportunity of bringing them prominently to the bureau's notice, and to respectfully offer the opinion that from a naval point of view, the remarkable behavior and condition of the supporting structure are fully as important matters for consideration as their immediate causes, the projectile-breaking qualities of the plate."

In order to make a satisfactory comparative test of the relative resisting powers of armor of nickel-steel and of nickel-steel Harveyed, the Admiralty ordered a large plate 12 by 8 feet of nickel-steel, 6 inches thick. This was cut in half, making two plates of the usual dimensions. One of the halves was treated by the Harvey process, the other finished up as a nickel-steel plate. The Harveyed plate was tried on board

[1] Fragment fired at alone considered; its weight was 4.4 tons.

the *Nettle*, January 19, and a report of the trial was given in the April NOTES. As later information gives the results more in detail, the full report is appended below in order to make the comparison more perfect.

Test of 6-inch Harveyed nickel-steel plate on board the *Nettle*, January 19: Gun, 6-inch B. L.; projectile, 100 pounds; distance of target from muzzle, 30 feet.

Round 1.—Charge 30.5 pounds; velocity 1507 foot-seconds; energy 1575 foot-tons. The projectile (Palliser) was pulverized, penetration insignificant, plate uninjured.

Round 2.—Charge 42 pounds (full service); velocity 1815 foot-seconds; energy 2294 foot-tons. The projectile (Holtzer) was broken up, plate cracked.

Round 3.—Charge 48 pounds (battering); velocity 1930 foot-seconds; energy 2664 foot-tons. The projectile (Holtzer) just perforated the plate and was found in the form of fragments in the backing. New cracks formed in plate, but no pieces detached from backing.

Round 4.—Charge 42 pounds; velocity 1818 foot-seconds; energy 2294 foot-tons. Projectile (Holtzer) again broken up. Plate still on all backing.

Test of 6-inch nickel-steel plate on board the *Nettle*, February 28: Gun 6-inch B. L.; projectile 100 pounds; distance of target from muzzle, 30 feet.

Round 1.—Charge 30.5 pounds; velocity 1507 foot-seconds; energy 1575 foot-tons. Projectile (Holtzer) penetrated plate and lodged in backing.

Round 2.—Same charge, velocity, and energy as in Round 1. Projectile (Palliser) broke up, point remaining in plate.

Round 3.—Charge 36.5 pounds; velocity 1690 foot-seconds; energy 1979 foot-tons. Projectile (Palliser) penetrated the plate and sunk in backing 3 feet from its base to face of plate.

Round 4.—Charge 24.5 pounds. Point of projectile penetrated 8.1 inches from face of plate. Projectile (Holtzer) rebounded.

Round 5.—Charge 27.5 pounds. Point of projectile penetrated 9.1 inches and projectile rebounded.

A 14-inch nickel-steel plate, for the diagonal bulkhead of the *Oregon*, was tested at Indian Head, March 6. Three rounds were fired from a 10-inch B. L. R. The charge was 129.75 pounds; striking velocity 1381 foot-seconds; projectile, Carpenter armor-piercing.

Round 1.—Upper right corner; penetration 14.1 inches; hole smooth, with 5 cracks at the apex; usual fringe and bulge on face of plate; projectile rebounded 80 feet; backing and structure intact.

Round 2.—Bottom right corner; penetration 13.2 inches; an irregular crack, top to bottom of plate, 0.5 inch wide on the face; projectile rebounded 10 feet.

Round 3.—Bottom; penetration 14.2 inches; hole smooth; 5 cracks; projectile rebounded entire.

Backing and structure intact at end of test. Plate cracked but in very good condition, no part detached or any of backing exposed. Acceptance recommended. The armor was from Bethlehem.

Test of 4-inch plate from Carnegie, Phipps & Co. for the belt of the *New York*, made at Indian Head, March 12, 1898. Backing 36 inches of oak; three rounds from 4-inch B. L. R.; striking velocity 1595 foot-seconds; projectile Carpenter armor-piercing, weight 33 pounds; charge 9.56 pounds. One shot at each apex of a triangle with sides of 14 inches.

Round 1.—Penetrated plate; base 10.5 inches from face of plate. Effect on plate normal, fractured back bulge.

Round 2.—Penetrated plate; base 16.2 inches from face of plate.

Round 3.—Penetrated plate; base 16 inches from face of plate.

A fourth round was fired with 1650 foot-seconds velocity, charge 10 pounds 7.5 ounces. Penetrated plate; base 26.5 inches from face of plate. Plate passed premium test.

Test of 4-inch nickel-steel casemate plate for the *Oregon* at Indian Head, March 7. Gun used, 4-inch B. L. R.; projectiles, Carpenter armor-piercing, 33 pounds.

Round 1.—Charge 8.72 pounds, velocity 1491 foot-seconds. Penetrated

plate; base 15 inches from face of plate. Annular crack. Shot directed at centre of plate.

Round 2.—Charge 10.47 pounds; velocity 1676 foot-seconds. Shot 14 inches from first hole. Penetrated plate and backing (36 inches) and stopped by timbers in rear. Normal annular crack. Projectile shortened 0.03 inch, otherwise undeformed.

Round 3.—Charge 9.3 pounds; velocity 1561 foot-seconds; impact 14 inches from nearest shot-hole. Penetrated plate and backing to the third tier of timbers.

Plate passed acceptance but not premium test. Made by Carnegie.

MISCELLANEOUS MILITARY NOTES.

The British Army estimates for 1893-94 amount to £17,802,900, an increase of £171,600 over those for the current year.

A cyclist section in the British Army consists of 24 members, and one is allowed in each battalion of volunteers. The total number in 1891 was 1776; in 1892, 2218. Nearly one-half the volunteer battalions have a cyclist section.

The importance of the operations of our late war as object-lessons for the military student is just beginning to be appreciated in Europe. Among recent writers, Colonel Hutton, of the British Army, in an article in the *United Service* (London), calls attention to the importance of the work performed by the American cavalry and to the comparitively insignificant achievements of the German, Austrian, and French cavalry during the wars of 1866 and 1870.

One of the results of the reorganization of the Canadian militia is an increase in the total force. The garrison artillery has been strengthened and redistributed. At Esquimalt the number of batteries is to be increased from four to five, and the strength of each raised from 42 to 100, the imperial standard. At Halifax the four batteries are similarly strengthened. This gives these two points about 1000 artillerymen, while all the rest of Canada has to be content with 700.

During a discussion on the Army estimates in the British Parliament it was stated that 346,000 magazine-rifles have been manufactured. Of these, 56,000 have been issued and 70,000 sent to India. The new carbine will soon be issued. Eighty-six batteries have been supplied with the new 12-pounder field gun.

MISCELLANEOUS NOTES.

The stone dry-dock at Cronstadt, now nearly completed, is of the following dimensions: Length 600 feet, breadth 90 feet, depth on sill 28 feet.

The California Legislature has passed a bill appropriating $100,000 for the maintenance of a nautical school at San Francisco. Graduates of the school, it is expected, will obtain positions as junior officers in the merchant marine on the Pacific coast.

The Krupp firm keeps extending at a considerable rate. Their negotiations with Li Hung Chang have now ended in an agreement according to which the firm will erect a large foundry and rolling-mill at Kai-phing. The works will supply railway material for the line from Tien-tsin to Shanghai Kuan and the contemplated extension to Nirin.

MISCELLANEOUS MARITIME NOTES.

The bill incorporating the North American Canal Company was passed on March 27 by the Dominion Parliament. The company is formed to construct a canal from Lake Erie to Lake Ontario, deepen the St. Lawrence Canals, cut a canal from Lake St. Francis to Lake Champlain, and thence to the Hudson River.

The new Cunard steamer *Campania* made 23.5 knots on her trial trip, April 15.

L. S. VAN DUZER,
Ensign U. S. N.

SERVICE SALAD.

The Story of a Cavalry Regiment.

THIS is the title of a handsome book in octavo form by Wm. Forse Scott (late adjutant), published by G. P. Putnam's Sons, New York. It is the record of the FOURTH IOWA CAVALRY in the war of the Rebellion, and contains an introductory by O. H. La Grange.

We picked up this book to glance over it casually while we were lying in bed, waiting for the time to arise, and found it to be of such absorbing interest that, being in a well-regulated household, we came near losing what the Confederates caused us to lose many a time, and that was—our breakfast!

The historian tells his story in a racy style, and uses spice enough with the dish he serves to make it palatable to the general reader, and to cause the sluggish blood of veterans again to flow with the warmth of olden times, as the vivid scenes, here recalled, pass like dissolving views before his eyes. He again hears the ring of the horses' hoofs, the clarion notes of the trumpet, the clang of the glistening steel, and feels the warmth of the panting steeds as they rush to the furious charge.

He pays a high tribute to Senator Harlan for the zeal and energy that gentleman displayed at the commencement of the war, and the indefatigable spirit he manifested in caring for and preparing the troops of Iowa for the theatre of war. He often visited the regiment during its organization, and "visited camp so often that every soldier came to know him. Many men will remember how these visits added to their comfort, for the kind man always brought a quantity of things in his buggy for the comfort or convenience of the soldiers, which he carried into the barracks and presented himself. . . .

"He visited it in the field during the war, and in all its vicissitudes he was its steady friend; and in later years, at every gathering of the survivors, he is an honored guest. He may well be called the 'Father of the Regiment.'"

The historian leads us along through the days of inexperience while serving in Missouri, and tells of one of its captures made while patrolling. It was that of "a small party of white men, mounted and in citizen's dress, who had in their possession a negro man in handcuffs, fastened in a crouching posture on a horse. The account given of themselves was, that they were civil officers from Texas, and that the negro was a fugitive from justice. They had no papers to confirm that statement, nor any paper at all but a pass bearing the name of the commandant at Jefferson City. It was not at all probable that, a year after the war was begun, the governor of Texas would send civil officers to Missouri for a black delinquent. Not only was it a year after the beginning of the war, but five or six battles and many minor engagements had been fought in Missouri, and substantially the whole State was under martial law and controlled by the Union army. By any reasonable construction of appearances the men were merely slave-hunters and their captive a fugitive slave. The party was reported to Captain Peters, but he felt compelled by the pass to avoid interference. The black captive was carried away in his chains."

We do not know whether Captain Peters was a good soldier or not; but as the historian must be responsible for his introductory, we presume he was such,

as in that he says that "bitter lessons were required to teach the President and the people that *military education cannot make a good soldier.*" Military education would at least have informed Captain Peters of his duty in such a case, and that he would have not only been justified in releasing the slave, but in making prisoners of such a gang as was holding him in captivity. If "military education cannot make a good soldier," it is to be regretted that the different governments of the world have uselessly expended millions of money in keeping up their military schools. While we do not pretend to say that every man who receives a military education is a good soldier, still that is a fundamental requisite for being a perfect one, as far as perfection goes in the art of war. Military education is not confined to a school. A man may be a lawyer or a dry-goods clerk when he takes the field as a soldier, and although a graduate of Yale or Harvard, he has something to get in the way of a military education—by hard knocks if in time of war—before he is able to care and provide for an army and handle it on the battle-field. That some of our generals were incapable of handling armies, although graduates of the Military Academy at West Point, is not to be wondered at. They never had the opportunity of seeing great bodies of men arrayed against each other, much less to take charge of them. Even those who served during the Mexican War had but the limited experience of file-closers. When a cadet leaves West Point his actual military education begins,—that is, when he is placed in position to apply the principles he has been taught at his Alma Mater. If he then does not become a good soldier, it is not in the man to be one. A man is never credited with being a good lawyer, although admitted to the bar, until he has had at least one brief; a man is not credited with being a good physician until he has had some practice in his profession. But to be either, there must be education, whether in or out of schools.

The historian kindly leads us on with his regiment through Missouri and Arkansas, making a dash here and there upon the enemy, camping in the swamps along the Mississippi, and traversing the depths of unknown forests, telling amusing stories by the wayside, separated all the time from the main armies that were operating in the field. At last came the campaign of Vicksburg, when the Fourth Iowa Cavalry was called upon to take an important share. Our historian says:

"In October, Halleck having been called to Washington to act as general-in-chief of the armies, Grant was practically in command of the forces holding the great river above Helena; but he was without instructions for future operations. His orders still came from Halleck, but no movement was ordered or proposed. His army was then in Northern Mississippi, near Corinth, inactive. Early in November, apparently on his own responsibility, he ordered an advance from Grand Junction and Corinth, intending to occupy Holly Springs and Grenada. Although this movement does not appear to have been made as part of a distinct campaign against Vicksburg, it nevertheless was the first step upon the line upon which Grant thought that Vicksburg should be reached. Halleck gave his approval of the movement, in a vague way, in meagre dispatches; but stopped it when the advance had reached Holly Springs, by telegraphing that re-enforcements to the number of twenty thousand were being forwarded. If these re-enforcements had been sent, or if Grant had been permitted to proceed with the force he had, Vicksburg might have been taken six months earlier than it was, and at a cost vastly less than that which was afterwards required.

"While Grant was waiting for the promised troops, Halleck telegraphed him that Memphis would be made the depot of a joint military and naval expedition against Vicksburg. This was the first intimation to Grant of an entirely new plan. He was much puzzled, but explanation came in succeeding events. That noisy, ambitious 'political' general, McClernand, of Illinois, had left the division he commanded in Grant's army and gone to Washington. He was will-

ing to place at the disposal of the War Department the whole of his military genius, and would accept a position in which that genius would be unrestricted. He succeeded in inducing Lincoln and Stanton to authorize him to raise new troops in Illinois, Iowa, and Indiana, to be commanded by himself for an *independent* campaign against Vicksburg! He would quickly clear the Mississippi and open the way to New Orleans! There was nothing small in McClernand's plans. It is most difficult now to realize the fact that the President and the Secratary of War were actually supporting and urging on two independent generals in the field, carrying on independent campaigns at the same time and with the same objective,—the one hampered and restricted incessantly by the dispatches of the general-in-chief at Washington, while the other dealt directly with the Secretary of War upon a wholly different plan of operation! History records some military ideas that have made the judicious grieve; but this amazing piece of management must be unique!"

The situation described by the historian has its parallel in the campaigns of the Army of the Potomac,—not only while McClellan was within seven miles of Richmond, before the seven-days' battles took place, when McDowell was given an army of forty thousand men to operate from Fredericksburg against McClellan's objective, and told that he could co-operate with him if he found it convenient, but that he need take no orders from him. It was there that McClellan said he would have none of it,—he preferred to fight his battles alone. But even after McClellan had secured his new base on the James, and within two days' march of Richmond, a new army was formed under General Pope,—not to help McClellan in his two days' march, but the new army must march from Washington on its own independent campaign, and McClellan's army had to be called from the doors of Richmond to save the new army. The disaster occasioned by this policy ought to have been a sufficient lesson in the art of war to have deterred a repetition in the Vicksburg campaign. General Grant, however, "took the bull by the horns," and after McClernand joined, much to the latter's disgust, assumed command of the "independent" forces.

We would be glad to follow the Fourth Iowa by reference to its many and gallant deeds, but that would detract from the general interest of the reader. To those fond of military history we recommend a perusal of "The Story of a Cavalry Regiment." The time will not be lost, for, as the introductory states, "Historians find the best materials in such books. They are reservoirs of fact kept pure from prejudice. The truth is in them. Like deep springs among the hills, which yield refreshment while they mirror their surroundings, such books show forth the form and spirit of heroic days, and nourish patriotism while they give a soul to history."

W. H. P.

The Veteran's Lament.

THE days grow cold and colder
Year by year;
We feel we're growing older
Year by year.
What care we for merry dancing,
Or bright eyes with pleasure glancing?
Our lives are less and less enchanting
Year by year!

Of war and hard-fought battles
Year by year,
Of friendships rudely sundered
Year by year,
Of the silken cord that binds us
Until time to death consigns us,
Our infirmity reminds us
Year by year!

The spectral beck'ning finger
Year by year
Questions why so long we linger,
Year by year,
Draws us towards our comrades sweetly sleeping
In the graveyard, whither, weeping,
We, unwept, are slowly creeping
Year by year!

WILLIAM HOWARD MILLS.

THE *Army and Navy Journal*, New York, has published a special edition of the new Infantry Drill Regulations for the Army and the National Guard, with an appendix giving the interpretations to many questions in the new drill. Price, 50 cents. These interpretations were made by Lieutenant John T. French, Jr., Fourth U. S. Artillery, Recorder of the Board which prepared the new drill. The addition of these interpretations to the volume of the new Drill Regulations (being bound with it) makes a very handy volume for reference. Officers and men desiring to be fully informed on the new drill should secure a copy.

An army officer speaking of this volume says,—

"I find this arrangement a very handy one, and the book is thereby rendered very valuable to me or to any one who must study the Drill Regulations carefully. The *Army and Navy Journal* deserves the thanks of all concerned in its efforts to place the new Drill Regulations and their true meaning before the American soldiery."

The Song That Failed.

(*From the Spectator.*)

I WATCHED a cloud-streak red in sunset burn,
And as I looked, it faded;
I strove a song to shape, your smile might earn,
But thought drooped, sad and jaded.

It should have been a strain that meetly might
With your pure life-stream mingle,
Fresh as a breeze that from cold summits bright
Blows down on muffled dingle.

Instead, the humors of a mind distraught
Sighed back in self-derision;
The short flush died in the deep gray, and naught
The voice said, naught the vision.

Instead, there came the wearing inward ache,
The fret, and the misgiving,
The wounded love, the wondering pain that make
The bitterness of living:

Pale faith that fears itself, hopes without wings,
Man's puzzled eyes pathetic,
Ill omens that the ending century brings,
A hush of tones poetic.

Some other sunset I may search the west,
And that lost light discover,
My longing compass its unthwarted quest,
Fit lyric for true lover:

Or, in earth's air I ne'er may see that same
Fine dying flame of splendor,
Yet, haply elsewhere find the power to frame
A strong chant and a tender.

JOSEPH TRUMAN.

Our Coffee Substitute.

SOME time ago, when I was the senior corporal of — Company of the Fourth Regiment, National Guard of New Jersey, I was left in charge of a guard of honor. The guard consisted of a corporal and four privates, and had the cheerful duty of watching a coffin. I well remember how gloomy the dark Gothic church seemed, when the tramp of the sentry was the only sound that broke the silence, and the only lights in the place were over the coffin. The solemnity was too oppressive to be endured, and by midnight we had regained our usual cheerfulness.

Trusting that the corpse would not make any fuss if left alone, I called in the sentry, and a very sociable party sat down to supper. My chevrons gave me the head of the table and the division of what there was to eat.

Our supper had been nearly forgotten, but I "kicked" and secured permission to send for some sandwiches and coffee. When the stuff arrived we found it was only enough to tantalize us, and not enough to fill the aching void under our waist-belts. In this predicament we remembered that a fair had been held in the basement of the church that day. Some trusty foragers looked through the *débris*, and brought to light enough edibles to piece out our supper. They also found the crockery, linen, and silver to set the table.

In the supper-room they found a small brass tea-kettle, and beside it a paper bag half-full of a brown powder.

None of us had much housekeeping or cooking experience, and while we knew what the different articles of food and drink looked like when cooked, we were not so sure of them when uncooked. The brown powder looked like coffee essence, chocolate, or cocoa, while it had a slightly sweet taste.

"Guess it's good to drink, and we'll try it, anyhow," said a private.

So we filled up the tea-kettle with water, threw in two heaping teaspoonfuls of the powder, put it on the stove, and awaited developments. It began to boil and sing all right. When I guessed that it was done, I lifted the lid and smelt of it. Oh, that smell! the memory of it haunts me still. It was metallic, earthy, and chemical all in one. I let the rest smell. Their expressions of sadness and disgust were funny in their intensity. We had been cooking—*polishing powder!*

As soon as we recovered from our disappointment, we saw the joke of the affair and laughed heartily.

Before morning we cleared away all traces of our foraging and swore to mutual secrecy. But it was no use: the story was too good to keep; and while we sometimes brag of our shooting or drilling, we never, never brag of our cooking.

T. B. G.

"Unto the Third Generation."

An acorn fell where the heedless foot
Of a wayfarer pressed on the yielding sod.
The summer came when the germ found root,
And a tree grew tall where the pilgrim trod.
A hundred years! and the tree had grown
To a stately oak by the broad highway;
O'er a village inn were the shadows thrown
As the sun went down at the close of day.
The sign that swung in the soughing wind
From a spreading branch bore the legend quaint:
"Ride in, O guest, and a welcome find
For self and brute, be thou fiend or saint!"
The landlord, ruddy and gray and fat,
On the ample porch, as he sipped his wine
With a knowing leer, if he walked or sat,
Was a quainter thing than the swaying sign.
To that lodging old not a traveler came
But he heard the tale, with approving nod,
From the host, of a grandsire's lawless fame,
Who heedless once by the wayside trod.
The years went by; and the moor was bleak
Where the inn had stood, and the sign had swung.
In the wintry blast with a doleful creak
A form in chains as a culprit hung.
In letters clear to the branch o'erhead
Were nailed these words, as a sad complaint:
"Behold the doom of a son misled
By a sire who hailed either fiend or saint!"
Thus the acorn small that the pilgrim free—
As he journeyed on with an aimless gait—
Had crushed grew up as the gallows-tree,
Where the third of kin met a felon's fate!

H. H. Pierce,
Captain U.S.A.

Was Virtue Rewarded?

(*From the Brainton Banner.*)

The regiment was drawn up for church parade at Malta, but the church was being repaired and could not accommodate them all.

"Sergeant-major," ordered the colonel, "tell all the men who don't want to go to church to fall out on the reverse flank."

A large number quickly and gladly availed themselves of the privilege.

"Now, sergeant-major," said the colonel, "dismiss all the men who did not fall out, and march the others off to church,—they want it most."

A HOME LUXURY.

THE rise, development and growth of any great industry is a subject which is usually of interest to the average reader, especially so during this Columbian year, when the products of all nations, civilized and uncivilized, will be shown at the World's Fair, in Chicago. The work of the primitive man and woman will be exhibited side by side with the wonderful examples of the arts and industries of the people of our own times. Much may always be learned by comparison, but probably at no time in the world's history has the lesson been so easy to learn as it is to-day. The busy hands and brains of men are all the time at work seeking to invent devices whereby the products of the earth may be brought nearer the consumer. In many fields and among many industries may this be noticed, but because cocoa and chocolate have become so important in the household, we feel that an article treating upon them will be both timely and interesting.

The Chinese claim that tea has been cultivated, brewed, and drunk for many, many centuries; the people of the East claim that coffee is as old to the drinking world as is wine, and those who manufacture and use cocoa and chocolate claim for it just as long a history. The first that we learn of the fruit of the cocoa-tree being utilized as a beverage is from the early Spanish explorers, who, penetrating the Caribbean Sea, landed upon the adjacent shores. There the explorers were presented by the natives with a drink which they called *cacavate*. It was of a rich brown color, and very pleasant to the taste. It grew rapidly in favor, and for about four hundred years it has been the favorite beverage of the Spanish people. But this favor is by no means confined to the people of Spain. In this country it has grown in popularity year by year, until to-day it is used universally. Leaving aside the various merits of other table beverages, it must certainly be admitted that a properly cooked cup of cocoa or chocolate, taken with one's breakfast, is not only delicious, but at the same time possesses so many excellent qualities that they may take the place of all other drinks. Tea and coffee may be served with any meal, but the experienced epicure will tell you that the only proper place for cocoa and chocolate is on the breakfast table. Its mild, delicate flavor, its absolute purity, when properly made, and the nutritious qualities which it possesses, are reasons why it has become so popular in the refined homes throughout this country and Europe. In the words of an epicure, and a devoted lover of the beverage, "The only proper way to start the day is with a cup of chocolate." But there is no reason in the world why cocoa and chocolate should not be used at any time in the day—for lunch or dinner, as well as breakfast. At many fashionable evening gatherings a cup of fragrant chocolate is served in the place of the pernicious black coffee, and there are many reasons why it should be advocated for an evening drink. Insomnia is, as a rule, unknown to the chocolate drinker—certainly so much cannot be said of the habitual coffee drinker.

While four hundred years have probably brought very little change to the prepared cocoa—for then, as now, only the pure ground nut of the cocoa was used—yet the devices used to-day in the

Mode of Grinding Chocolate—Seventeenth Century.

preparation of the cocoa for the market are marvelous. Like everything else in our early American civilization, the manufacture of chocolate was primitive in the extreme. After the beans were roasted they were ground by stone querns or mortars, not unlike those used in grinding maize. These mills consisted of simply a flat stone with a short, thick, cylindrical stone, used as a roller. When the beans had been completely crushed an oily paste was found, and with this was mixed various flavors by the early cocoa users, just as vanilla is now used by the modern manufacturer. In those days every man—or more properly every woman, for it was women of the household who did the "grinding at the mill"—was his own chocolate manufacturer.

But to-day the manufacturer of cocoa and chocolate has arisen to the dignity of a great industry—one of the greatest in America. In the large factories the utmost care is used in every detail of the work. As is well known to our readers, cocoa and chocolate are the manufactured product of the cocoa bean (*Theobroma cacao*). It is a native of tropical America, from whence is still derived the larger portion of the world's supply, although of late years the tree has been introduced and cultivated in various warm countries. The cocoa trees grow to the average height of thirty feet, and from five to eight inches in diameter, are of spreading habit and healthy growth, and require comparatively little care. A cocoa plantation is picturesque and beautiful, and in the right soil the trees bear very freely. The fruit when young is green, but later becomes a lemon-yellow, or yellowish-brown. When matured, within the thick, tough rind it contains from twenty-five to forty seeds, surrounded by a fleshy pulp, and arranged in rows. These seeds are at first colorless, but on drying and exposure to the air and light they become golden-yellow, red, or brown in color, and hard and brittle. They are about the size of almonds, and have a bitter taste.

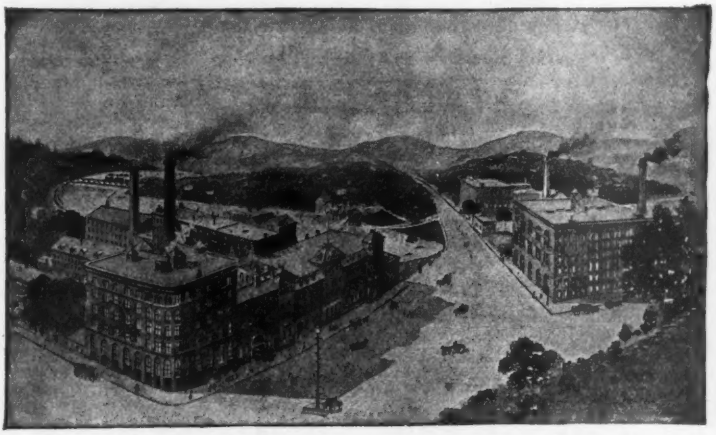
After the fruit is gathered, the seeds are removed from the pod and undergo various processes of sweating and curing before they are ready for the market. In order to produce what is known as unfermented cocoa the beans are freed from adhering fruit pulp, and at once dried in the sun. For the production of fermented cocoa, the beans are placed in piles in sheds, or buried in trenches and allowed to ferment for a time before being completely dried in the sun. Much of the acidity and bitterness disappear in the process of fermenting. The beans so prepared are mildly oleaginous, of a pleasing but slightly bitter taste, and are more or less aromatic. The value of the product greatly depends upon the care bestowed upon this operation, and the sweating or fermenting is a process which requires the very greatest attention and experience. The operation varies according to the state of

Fruit and Seeds of the Cocoa.

the weather, but a period of about two days yields the best results. After that the seeds are exposed to the sun for drying; and those of a fine quality assume a warm reddish tint, which marks beans of a superior quality. Because the reader may be still further interested in this subject, it may be well to state that the beans of commerce somewhat resemble small pecan nuts in color, shape, and size. They have a thin, brittle shell, surrounding a full, well-filled kernel, of reddish-gray or reddish-brown color, with a shining, oily surface, the whole crushing easily under a strong pressure. To those who have had experience with the cocoa-nut the color of the shell and the kernel and their bitterness tell of the degree of perfection of the fermenting process, which develops the natural qualities of flavor and odor.

A great deal has been written and said about cocoa butter, and it may be well at this time to say a word regarding it. Cocoa butter is really the oil of the *cacao*-nut. As is already well known to our readers, this oil possesses great nutritive qualities, to which the value of cocoa or chocolate is very largely due. As the chemist will tell you, theo-bromine is the element, present in a small proportion, that gives to cocoa its flavor and stimulating qualities. The remainder is made up of albuminous elements, having nitrogen as a base, easily digested and very nutritious, a small portion of cellulose forming the walls of the cells in which the other elements are contained, starch, and a small proportion of other elements, all of little food value. It has been the object and aim of the modern manufacturer of these preparations to remove the bad elements from the cocoa nut, so they shall be absolutely pure when they come to the hands of the user. How far they have accomplished this is best shown by the high grade of the goods which are to-day in the market, and which are on the tables of the thousands upon thousands of the best people of our land.

There are many old and time-honored establishments in America, but there is none better known and whose record for honesty and fair and square dealing is better known than that of Walter Baker & Company, of Dorchester, Mass. Over one hundred years ago Walter Baker established the manufacture of chocolate in this country, in a small and modest building, and the title deed, which still hangs in the company's office, bears the date 1757. Because the goods produced have always been of superior quality, the business has from that early date continued to grow, so to-day it is the largest manufactory of the sort in America. The company's plant at Dorchester is a marvel. It covers more than forty acres of ground on both sides of the Neponset river, and there are some twenty structures,



Bird's-eye view of Walter Baker & Company's factories at Dorchester, Mass.

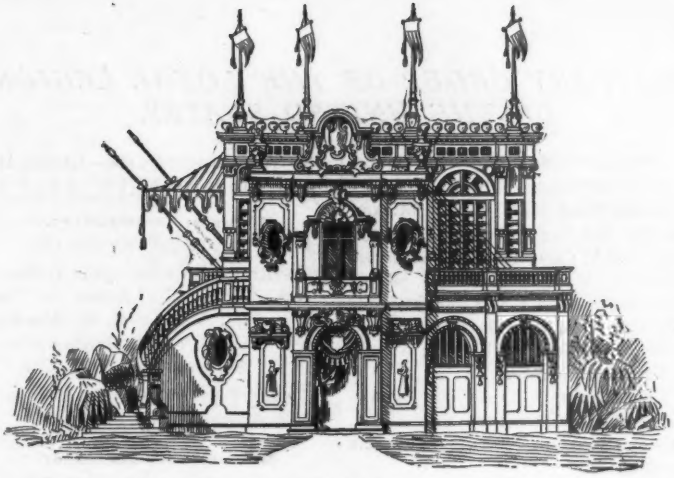
Theobroma Cacao.

which include the great factories, the warehouses, shops, stables, etc. It would be impossible in this short article to give anything like an intelligent description of these great works. Scattered over the space it may be seen by the accompanying illustration that the main factory buildings cover much ground, there being several hundred feet frontage, these buildings having a floor-space of about 315,000 square feet, or over seven acres.

Something has already been said of the growth of the cocoa, and the scientific side of the wonderful product. Now we will add a few words regarding the preparation of the article for food. The nuts reach the market in all forms, and in various stages of uncleanliness; dirt, sticks, pieces of dark, small stones, and other foreign substances being found. Their removal is the first thing to be done in the factory. The process is a slow but thorough one. The kernels are placed in cylindrical sieves or screens, sloping slightly, and with graduated meshes, through which the impurities find their way as the mass is slowly shaken down the slope. Next comes the hand-picking, one of the most interesting processes of the whole work. Here the most experienced people are required, the work being to remove the few larger substances that escape the screen; and any beans whose defective color, size or shape betray their inferior quality are immediately rejected.

Next comes the roasting, and upon this hinges very much of the success or failure of this great industry. The manufacturers tell us that both chemical and structural changes depend upon the roasting, and that it is the most delicate operation in the manufacture of chocolate. It may seem strange to the reader, and the lover of

Branch of Chocolate Plant.



Walter Baker & Company's Exhibition Building, Chicago.

chocolate, that the very best beans are easily ruined by unskilled roasting, and that inferior grades are greatly improved, if properly roasted. A scientific apparatus is in use at the mills above referred to, which seems to have reached well-nigh perfection. By its use the nuts are roasted with perfect uniformity, and their very best qualities are brought out. The superior quality of the goods produced by the Dorchester establishment speak so highly for themselves that we shall not at this time attempt to go further into a description of their modes of manufacture.

But we wish to add a word regarding the beautiful exhibition building of the Walter Baker Company, at the World's Fair, in Chicago. It will be light, airy and exceedingly attractive, covering a large space of ground; it will show within its walls a great variety of delicious and nutritious articles manufactured by this house. The building was designed by Messrs. Carère & Hastings, who built the Ponce de Leon at St. Augustine. It occupies a most conspicuous place in the World's Fair grounds, and will doubtless be visited by thousands and tens of thousands of people who have used and enjoyed the products of this famous house.

MILITARY ORDER OF THE LOYAL LEGION OF THE UNITED STATES.

Pennsylvania Commandery.

Stated meeting held May 3, 1893.

To the First Class.—Dr. D. M. Anderson, U.S.V.; John E. Doughty, Capt. U.S.V.; D. F. Gerrish, Act. Asst. Engineer, U.S.V.; John W. King, Commodore U.S.N.; E. S. Moffat, Capt. U.S.V.; Jesse Merrill, Maj. U.S.V.; Fred. A. Tencate, Lt. U.S.V.; Alonzo J. Thompson, Lt. U.S.V.

To the First Class (by inheritance).—Jas. L. Lardner, Frederic A. Molitor, Bertram H. Taylor, Francis B. Shalters.

To the Second Class.—David B. Abbott, Robert W. Giorn, Gibbon G. Cornwell, Robert R. Harvey, Herbert M. Morris, Percy Bowman Metzger, Wm. R. Ricketts, Chas. G. Trumbull, John A. Tompkins.

The following officers were elected: Commander, D. M. McGregg; Senior Vice-Commander, Edward E. Potter; Recorder, J. P. Nicholson; Registrar, Dr. H. E. Goodman; Treasurer, Frederick Schober; Counsellor, W. L. James; Chaplain, Rev. Dr. Henry C. McCook; Counsel, H. B. Seely, H. M. Denniston.

The office of Junior Vice-Commander was not filled, because the two candidates, William Brook Rawle and Charles G. Sawtelle, each polled ninety votes. The office will be filled at the October election.

Maine Commandery.

Stated meeting held May 10, 1893.

To the First Class (by inheritance).—Leonard A. Pray.

To the Second Class.—David W. Parsons.

Massachusetts Commandery.

Stated meeting held April 8, 1893.

To the First Class.—Henry H. Boyce, Capt. U.S.V.; Henry N. Corney, Capt. U.S.V.; Isaac H. Edgett, Lt. U.S.V.; Joseph J. Giles, Lt. U.S.V.; William A. Heard, Lt. U.S.V.; Willis Howes, Act. Master U.S.N.; H. A. Oakman, Col. U.S.V.

To the Second Class.—Daniel H. Kane, John B. Read.

Michigan Commandery.

Stated meeting held April 6, 1893.

To the First Class.—John T. Hammond, Lt. U.S.V.; Alfred A. Van Cleve, Capt. U.S.V.; C. S. Wortley, Lt. U.S.V.; G. W. Buckingham, Capt. U.S.V.; Seymour Howell, Lt. U.S.V.

To the First Class (by inheritance). W. B. Adams, Maj. U.S.A.

Minnesota Commandery.

Stated meeting held April 12, 1893.

To the First Class.—R. W. Adams, Gen. U.S.V.

To the Second Class.—George A. W. Fairbrother.

Colorado Commandery.

Stated meeting held May 2, 1893.

To the First Class.—John G. Kelley, Capt. U.S.V.; George S. Newman, Lt. U.S.V.; William H. H. Conley, Lt. U.S.V.

To the First Class (by inheritance).—Thomas F. Azpell.

NECROLOGY.

Pennsylvania Commandery.

John F. Lawrence, Maj. U.S.V., March 27, 1893.

New York Commandery.

Lawrence Johnson, Lt. U.S.V.; P. Jones Yorke, Col. U.S.V.; George J. Collins, Lt. U.S.V.

District of Columbia Commandery.

H. C. Nelson, Med. Insp. U.S.N., March 10, 1893; P. V. Hagner, Gen. U.S.A., March 11, 1893; Horatio Bridge, Pay-Dir. U.S.N., March 18, 1893; Hiram Berdan, Gen. U.S.V., March 31, 1893.

Colorado Commandery.

A. B. Hough, Lt., March 22, 1893; J. W. O. Snyder, Surg., March 26, 1893.

Baking Powder For the Army And the Navy.

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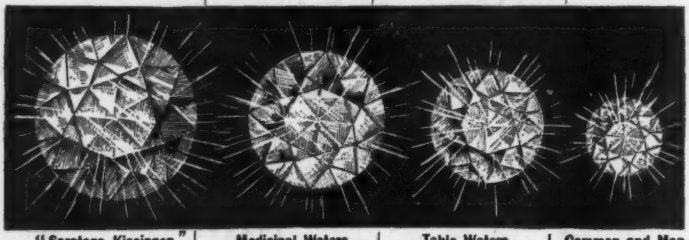
"Paste,"
good for nothing sometimes cut a swell. Owned by ??



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POSITIVELY PURE TABLE WATER

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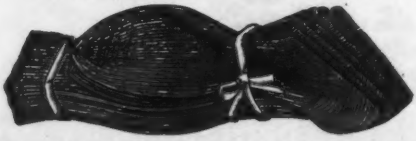

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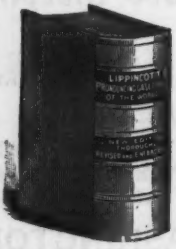

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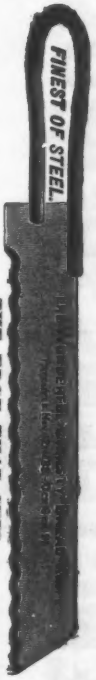

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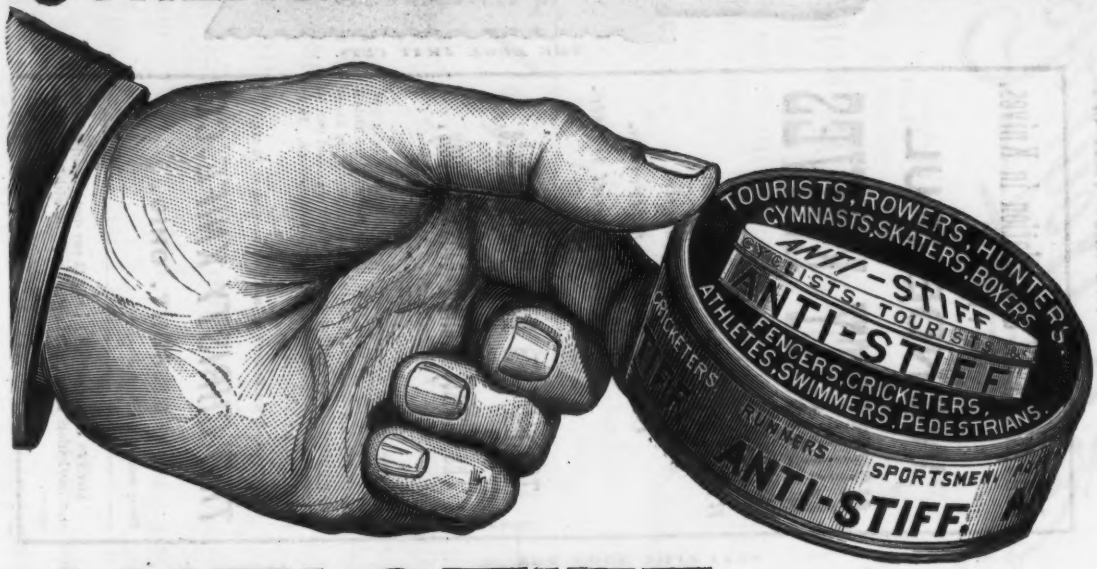

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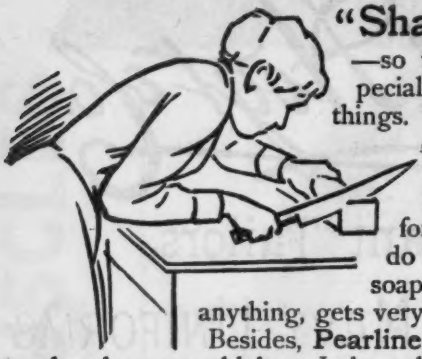

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NEW SERIES.

VOL. IX.—JUNE, 1893.—No. 6.

FURNISHED BY STUDENTS LECTURE ASS'N.

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NEW SERIES.

VOL. IX.—APRIL, 1893.—No. 4.

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